TRANSACTIONAL RELATIONSHIPS AMONG A HOME VISITOR, MOTHER, AND CHILD IN A STRUCTURED-TEACHING SITUATION

By

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To my wife Elaine,

who makes all things possible

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TRANSACTIONAL RELATIONSHIPS AMONG A HOME VISITOR, MOTHER, AND CHILD
IN A STRUCTURED-TEACHING SITUATION

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The present study examined the relationships among a home visitor, mother and infant in an intervention study. Also examined were the direct relationships between the interaction between the home visitor and mother at each of the six videotaped visits and the child's competence.

The subjects were 53 children of the lower-socioeconomic income level from in and around Gainesville, Florida. Home visitors visited the mother-infant dyads weekly, from the infant's third month of life until it was 52 weeks of age. Every sixth weekly visit was videotaped. The videotapes were examined using several structured-observation instruments. Two of these, the Watts Home Scale and the Escalona Scale examined mother-baby interaction, while a third, the Reciprocal Categories System, examined the interaction among all three participants. Mother-baby interaction scores were derived by a previously completed factor analysis of all three scales. The home visitor-mother interaction was characterized by

items from the Reciprocal Categories System which reflected three items on one of the Mother-baby factors. The child's competence was measured by scores on four factors of competence developed by a factor analysis of several measures of competence. The first measure was the Social Abilities Scale, examining the child's ability to use his surrounding environment. The second competence measure used, the Series test, included tasks similar to those of the intervention curriculum, but at an advanced level of complexity. The third measure was the Bayley Mental Development Index, a traditional measure of intelligence.

The relationships between the home visitor-mother and mother-baby interaction were examined through a modified cross-lagged panel correlation technique. This technique allowed statements of influence to be made based on correlational, panel data. In the present study, indices of redundancy, based on canonical correlations between the two sets of variables, were used instead of correlations between individual variables to determine which set of variables was more influential. Since six panels of data were available, the effects had by time on the obtained indices of redundancy were open to examination. Based on previous research, an examination was also made as to the appropriateness of separate analyses of male and female tryads. The results of this examination showed that separate analyses were appropriate.

The 12 comparisons of the indices of redundancy figured (six for each sex infant) showed the set of Mother-baby variables to be the more influential of the two sets in nine of the comparisons.

Straight sex differences were found, with differences between redundancies of variance being explained by the two sets of variables being larger for the males. Time was found to interact with sex, with the amount of redundant variance in the Home visitor-mother scores, given the Mother-baby scores generally increasing over time for males while decreasing for females.

The relationships between the Home visitor-mother interaction variables and the child's Competence factor scores were examined through canonical correlations. Where significant canonical correlations were found, further analyses, using multiple regression, were to be undertaken.

None of the canonical correlations figured among these sets of variables were significant. Because of this, no further analyses were undertaken and no statements made concerning how Home visitor-mother interaction affected the child's competence.

The results of the present study seemed to indicate that, in the quantitative sense, the home visitor had less influence on how the mother interacted with her child than was assumed. Questions remained, however, as to possible other influences had by the home visitor. Several alternative methods for examining these questions were presented.

CHAPTER 1
INTRODUCTION

Since the mid 1960's, there has been a growth of interest in the area of intervention in the lives of disadvantaged children. This interest has been spurred by the demonstration that these children, perhaps due to their every day circumstances, exhibit developmental differences when compared to children from less disadvantaged backgrounds. There have been several methods developed for intervention into the home circumstance. One of these methods has been small group discussions, where parents meet and discuss topics related to the rearing of their children. Another of these methods is to visit the child's home to help the mother focus her childrearing skills to the point that they help the child's development approach its full potential. Most studies investigating home visitation have worked on a level of analysis in which experimental and control groups are identified, with the experimental group being exposed to a curriculum or some specialized interaction while the control group is not. The success or failure of the method of intervention is then judged on the basis of differences in the measured intelligence between the two groups of children.

While such studies are encouraging, little is described concerning those aspects of the programs which are the important factors in fostering the development of the child. To answer this question, studies need to look within the experimental group and

examine variables that might be crucial to the successful outcome of the intervention.

Such intragroup designs have been used by Weikart (1969) in the examination of three different curricula and their effectiveness in a preschool intervention program. A similar examination was attempted by Gordon and Jester (1972) in their study of several factors within their program which might make a difference in the success of intervention in disadvantaged infant's lives. Among the questions asked were: what type of home visitor is most effective in working with the mother? Is it necessary that the home visitor have a college degree, or is it possible to use people with less education? Another question concerned the relationship of the infant's sex and development. Is the impact of the intervention dependent on the sex of the child? Do the home visitor and mother interact differently as a function of sex? Are the results of this interaction related to the child's sex?

Gordon extended this analysis to examine what behaviors on the part of the mother related to her child's development of competence (Gordon, 1974). Such studies help focus attention onto specific aspects of programs and thus help determine how best to intervene in the life of the disadvantaged child.

In most home visitation programs there are three people in the intervention stiuation. First, there are the mother and her child, for their relationship is usually the focus of the intervention. There also is the home visitor, the person who brings the program materials into the home and presents them to the mother. Because

she is the primary bridge between the program and the mother and child, she has a crucial role to play. There are, however, no analytic studies of this role.

This study examines the role of the home visitor and how she affects the mother-child dyad. The study focuses on four questions concerning the importance of the home visitor and what she does in interacting with the mother. First, what relationships exist between the home visitor-mother transaction and the mother-child transaction? Does one relationship consistently precede the other, or are they totally unrelated? Second, does the home visitor's actions with the mother have any direct relationship to the child's development, or is her influence indirect, by way of the mother's reactions to her help? Third, do the relationships examined above change over time? Do the relationships strengthen or weaken as the child matures? Fourth, what role does the sex of the child play in the relationships examined? Are the relationships between both the home visitor's actions with the mother and her actions with the child different for boys and girls? What about the direct relationships? Are they different for boys when compared to girls?

With the examination of these questions it may be possible to move toward a more complete picture of the actual intervention situation. It will be possible to describe not only the relationships between mothers and their children, but also the relationships between the major agent of intervention and the mother. In this manner it will be possible to make more accurate statements concerning how an intervention program might affect a mother's interaction with her infant.

CHAPTER 2
REVIEW OF THE LITERATURE

This review will examine first the literature dealing with parent behavior and its relationship to the child's development. This will include studies dealing with the maternal behavior and the relationship between a child and its mother, the mother's teaching style, and differences between middle- and lower-class mothers.

Attempts to use these findings to intervene in the lives of children who have a strong possibility of showing less than adequate development then will be reviewed. Two types of intervention programs will be examined: the group approach where the parent and/or child are exposed to the program via small group discussions and activities; and the home-visitation approach, where the agent of intervention visits the home to work with the child or mother.

Mother-Child Relationships and Child Development

There are an impressive number of studies which examine how the child's development is affected by the mother's behavior. These studies can be grouped under three classifications as a function of the variables examined. These variables include: (1) maternal behavior and the mother-child relationship; (2) the teaching style of the mother; and (3) the differences between middle- and lower-class mothers in their interaction with their children.

Maternal Behavior and the Mother-Child Relationship

In this particular area of research, two different approaches are used in examining these variables and their relationship to the development of the child. The first approach is that of natural observation, where the mother and child are examined in their everyday surroundings and the results of these observations related to the child's development. Next are the studies which use a situation which has been structured by the investigator to help isolate and enhance those variables under investigation. The review in this area of research is grouped according to those two approaches.

Natural observation studies. Rubenstein (1967), in examining maternal attentiveness to 45, 5-month-old infants, found that it was related to the children's exploration of the environment as measured at 6 months of age. Maternal attentiveness was defined as the number of times the mother was observed to look at, touch, hold, or talk to the infant during visits made to the home. The conclusions included that maternal attentiveness very likely does facilitate the development of the child's exploration of its environment. An alternative explanation was entertained where the child's higher exploration of the surrounding environment was seen to increase the mother's attention to the child.

In examining the development of competence by infants, Ainsworth and Bell (1972) found that at least for their definition of competence (i.e. the adequate control by the child of the major mediator of its contact with its surroundings, its mother) a harmonious

relationship between mother and child seemed crucial. In this study, 26 white, middle-class mother-infant pairs were observed in four-hour sessions in the homes, three weeks apart for the first year of life. The determination of the harmony between the mother and the infant was accomplished by examining variables on the part of both the participants in the dyad. The child was examined for the frequency and duration of crying episodes during the home observation while the mother was observed for her frequency and duration of ignoring these communications. In examining the mother's responsiveness and its relationship to the child's crying, the investigators broke the year's observations into four three-month quarters. With this grouping of the data, responsiveness on the part of the mother in one quarter was found to be inversely related to the child's frequency of crying in the next quarter. This investigation also found a generally harmonious relationship over the child's first year of life served his development in several different areas. The child's development was affected in its ability to communicate its wishes, needs and desires, as well as its ability to deal directly with the physical environment.

The variable of maternal "warmth" was examined in a study undertaken by Radin (1970). The study included 52 lower-class mothers interacting with their children at home. The level of "warmth" shown by the mother was determined through counting the occurence of three different sorts of behavior on the part of the mother. Variables counted were: how many times the mother reinforced her child either verbally or physically; the number of

consultations the mother made with her child; and the frequency with which the mother showed sensitivity to her child, via her anticipating her child's requests or feelings. When correlated to cognitive development as measured by gain scores on the Stanford-Binet (S-B) and Peabody Picture Vocabulary Test (PPVT), from entry to the end of a preschool program, "maternal warmth" was found to relate strongly to the child's development. This relationship was seen in terms of motivation, with the child who experiences maternal "warmth" exhibiting a desire to master challenging tasks.

Looking at a similar variable, Robertson (1962) found the lack of "meaningful affect" on the part of the mother to be related to deficiencies in several areas of the child's development. Babies who were considered (by inspection of records over a 12 month period) to have received inadequate mothering were found to show deficiencies in the areas of body tonus, muscular development and responsiveness at the age of 12 months. The classification of mothering as inadequate was on the basis of a lack of meaningful affect on the part of the mother, in which she showed no real concern over the child's needs and desires.

In a review of many of the studies attempting to examine relationships between childrearing practices and the eventual development of creativity, Dewing (1970) concluded the most important variables in the fostering of creativity seemed to be the non-authoritarian sort of discipline; diverse and relatively intellectual interests, and parent-child relationships which were not overly dependent.

Watts, in a longitudinal, natural observation study (Watts, Barnett and Halfar, 1973) attempted to gather data on children in their natural environment from ages 1 or 2 years and relate these observations to the competence they showed at age 3.

The observations of the child's surroundings were accomplished in sets of five full-day episodes, these episodes being separated by approximately two to three weeks. Different groups of children were observed for two, three, or four sets of episodes at different ages. Thus some children were observed for one day every three weeks from 24-27 months and again at 30-33 months while other children were observed at 12-15 months, 18-21 months, 24-27 months and 30-33 months.

In each of these observations, the observers followed the mother-infant dyads around in their homes and to other places as they went on with their regular schedule. While following the mothers and their children, the observers would tape record a running commentary on how the dyads interacted during the observation. Later these commentaries were scored using a scale examining some six dimensions of this interaction. Examined were: (1) who interacted with the child; (2) the quality of this interaction; (3) the style or technique the other person used in interacting with the child; (4) who initiated the interaction, the mother or the child; (5) whether the interactor (mother or principal caretaker) encouraged or discouraged the child; and (6) whether the interactor was successful in her attempts to control the child. Also included was a scale to quantify the child's interactions

within the physical environment and two questionnaires dealing with how typical the observation was of the child's normal routine and characteristic of the mother, such as personality, background, and such.

The subjects observed in this manner were two groups: one group whose children were identified as being very likely to obtain high competence (A children), and another group whose children were identified as being likely to perform poorly on tests of competence (C children). The assignment to group A or C was accomplished through consideration of several variables. First several pretests were given at the point of entry (either 1 or 2 years of age). Also considered were other factors within the child's environment which had previously been identified as being associated with high or low competence. These factors included several mother-behavior and physical-environment variables.

The obtained results seemed to show that A children had two distinct advantages as far as their intellectual development was concerned. First it seemed that the people in their environment devoted more time to them overall and secondly more of this time was used selectively to promote intellectual development. The study concluded that those children who exhibited high competence (A children) and those who did not show this degree of competence (C children) differed in more than just innate capabilities. While problems existed in the composition of the A sample (over representation of upper middle class graduate students as parents) the study still concluded that differences existed between the environments

of these two groups of children. These differences played at least a partial role in determining how competent the child became.

Another important conclusion, one that ties in directly with the later examination of intervention programs, is that the curriculum that seemed to exist within the homes of these children was neither hidden nor unsystematic. Indeed it seemed to be observable to the extent that differences could be isolated and examined. If differences in the natural environment can be identified, and if these differences are found to relate differentially to the child's development of competence, intervention programs should be able to, through the structured manipulation of the child's environment, increase the child's chances for developing a higher level of competence.

In a massive study of two infants during their first 2 years of life, Escalona and Corman (1971) examined how the mother's presence related to several types of infant behavior. In this study, each infant was observed by two independent coders for two hours each week over the first 2 years of their lives. The observers wrote narrative accounts which were later scored on the frequency of occurrence for several types of behavior events. These behavioral events were grouped into three scales. Each of these scales (Social Input, Social Output, and Social Interaction) required a definite response from the infant for an item to be scored. For example, the Social Input Scale measured the child's response to what someone else did. This response could not be inferred, but rather had to be observed. After these narratives were scored, the resulting

scores were analyzed and "patterns of experience" were produced. The patterns summarized, for a given time span in the child's life, the frequency with which he showed certain social behaviors and/or the frequency of social events to which he was responsive.

Escalona and Corman found support for their hypotheses concerning differences in experience leading to the differential development of the ability to discriminate the mother from others. These differences in experience were also found to determine the strength of the tie between a mother and her child. It was concluded that the behavioral events in the everyday life of the infant were anything but random. A high degree of regularity in these events was found reflecting maturational constraints as well as social-cultural and personal-style determinants. This conclusion relates once again to the later examination of the systematic attempts to influence the daily life of the infant.

Using a different methodological tactic, Wachs, Uzgiris, and Hunt (1971) examined the relationship between cognitive development and the environmental factors which surround an infant. A second concern of the investigators was the question of whether deficiencies in development were observable at an earlier age than normally found. Using a cross-sectional approach, groups of children at five different ages (7, 11, 15, 18, and 22 months) were examined. The infants' development was assessed with the Infant Psychological Development Scale, (IPDS), developed by Uzgiris and Hunt (1966) and based on the developmental stages of Piaget. Each child's home circumstances were examined with a home-stimulation scale. This

scale focused on both the physical circumstances in the home and the interaction between the mother and her child.

Several relationships between the development as assessed and the infant's environment were found. One such relationship was the negative correlation between the level of noise in the home and the score the child achieved on the IPDS at 11 months. Because of differences found in development between middle-and lower-class children at 11 months of age, the authors concluded that deficits do exist in the development of lower-class children at an age earlier than that which was previously accepted. These deficits were not usually tapped, however, because of a restricted range of socioeconomic status (usually upper-middle to upper-lower) and dependent variables that collapsed many of the infant's performances into one overall score such as Intelligence Quotient (IQ), Development Quotient (DQ) or Mental Age (MA).

Structured situation studies. By the definition used here, a structured situation is a definite environmental context which has been developed by the investigator to help isolate and enhance the appearance of those variables under scrutiny. Thus we cover the range from observation in a special nursery by Ourth and Brown (1961) in their investigation of crying in neonates to the traditional situation used to assess infant attachment (Ainsworth, Bell, and Stayton, 1971; Serafica and Uzgiris, 1971).

In their study of neonatal crying and its relationship to holding, Ourth and Brown (1961) found that a group of infants being held during feeding and given specific and rhythmical body

stimulations cried significantly less than did a comparison group who were held as little as possible. These results were taken by the authors as pointing toward adequate mothering being a continuation of stimulations which normally occur intrauterinely. The periods of holding continued the general level and quality of stimulation the child had experienced in the womb.

In a study attempting to relate nursery-school-aged children's internal locus of control expectancies to his cognitive development, Stephens (1973) found that a measure of locus of control correlated with both a traditional measure of intelligence, the Wechsler Preschool and Primary Scale (WPPSI), and performance on a series of Piagetian tasks. In an attempt to determine parent behavior antecedents of internal control development, another group of mothers and infants were put into a structured-teaching situation and observed for 20 minutes. The mother behavior variable found to correlate most highly with the child's development of internal control was "Quality of Total Relationship" as observed in the situation. Stephens concludes that because this relationship was found, there was a solid foundation for the attempt to facilitate the child's development of an internal locus of control via parent education and/or consultation.

Using response decrement as a measure of perceptual-cognitive development in 12 week old infants, Lewis and Goldberg (1968) found consistent positive correlations between maternal response to infant behavior and cognitive development. The mothers and their infants were observed in a controlled setting with various behaviors

on the part of the mother being observed every 10 seconds. In this situation, the infant was placed in a reclining seat with a panel on which the test stimuli were presented 18 inches in front of him. The mother sat to the rear and side of the infant. She was not instructed either to help or ignore her infant during the presentation of stimuli. Response decrements were found to positively correlate with the amount of touching, looking, holding, and smiling the mother exhibited. The amount of time the mother spent reading was negatively correlated with response decrement. From these results, it was concluded that maternal behavior stimulated within the infant an expectancy that the infant's behavior could affect its environment which motivated it to produce and utilize behaviors and skills not reinforced in its past experience.

Beckwith's (1971) study dealt with mother's verbalization in a structured-interview situation and their relationship to their infant's babbling. When the infants were 8.7 months old, the mother's verbalization to a third person related positively to the frequency of babbling on the part of the infant, while her frequency of verbalization directly to the child was inversely related to it. In less than two months (chronological age = 10.0 months) opposite relationships were found. It seemed, then, while at an earlier age the mother's verbalizations to the child directly suppressed babbling, soon after they served to facilitate the behavior.

Bell (1970) in a study of 33 infants' development of the concept of object, found a strong relationship between it and the quality of infant-mother attachment. It was found that the infant having a good attachment to the mother developed the concept of

the permanence of persons at an earlier age compared to those infants with less adequate attachments. This person permanence was seen as possibly affecting the child's development of object permanence. The infants were tested on these dimensions of person and object permanence over some five visits to the home. One week after the last assessment, the infants were exposed to a structured-strange situation and grouped on the basis of the attachment behaviors they showed. On the basis of this grouping, those children who showed behaviors indicative of a strong attachment to their mothers showed greater development of both person and object permanence during their at home assessments.

Serafica and Uzgiris (1971) similarly examined infant attachment and its relationship to the child's development of the concept of object. The situation used here had 17 components designed to test the attachment bond between the child (from 4 to 12 months) and its mother. These situations included the introduction of a stranger into the situation, the mother's leaving the child, and other situations designed to test the attachment felt by the child toward its mother. The concept of object was tested by the use of the Hunt-Uzgiris Scale (IPDS). Age trends were found in the types of differential responsiveness infants showed in interaction with their mother or a stranger. A correlation of .40 was found between the development of the concept of object and scores on an interpersonal-relationship scale used to examine the child's interactions with its mother and a stranger.

This correlation was seen to support the hypothesis that there is a relationship between the development of the infant-mother

attachment relationship and object-concept development. Such a relationship seems to be reciprocal in nature, with the infant's attachment being influenced as much by its development of the concept of object as is the concept of object influenced by the mother-child attachment.

In another study using a situation similar to that used above, Ainsworth, Bell and Stayton (1971) found systematic individual differences existed in the way 1 year old children adapted to a strange situation. Some 26 children were examined and were found to differ on two major dimensions: (1) the extent to which attachment behavior replaced exploratory behavior during brief separation episodes in the strange situation and in the reunion episodes that followed; and (2) the intensity and quality of attachment behavior in the reunion episodes.

The children were divided into three groups on the basis of these dimensions. First were Group A children, who seemed to neither maintain contact with their mothers nor seek proximity to them in the reunion episodes. The second group of children, Group B, showed heightened attachment behavior when the mother left them in the strange situation as well as actively seeking to gain and maintain contact with her during the reunion episode. Group C children also showed heightened attachment behavior when separated from their mothers, but were more ambivalent in the types of behaviors they exhibited than were the Group B children.

In an attempt to understand why the three groups acted so differently, the children, with their mothers, were observed at

home. The mothers were the major focus of the observation. Four nine-point rating scales were used to examine facets of the mother's behavior toward her child. In all scales, a higher score characterized more positive behavior on the part of the mother. The first scale examined the mother's sensitivity to her child's signals. The second scale examined how accepting or rejecting the mother was towards her child. The third examined how cooperative the mother was in her dealings with her child. The fourth scale examined how accessible the mother was to the child's signals for assistance.

On the basis of these scales, differences were noted between the A, B, and C mothers. The mothers of Group B children scored above the median on all four scales, while Group A and C mothers scored below the median on all scales. The mothers of Group A children were found to be especially rejecting, while the mothers of Group C children were found to be either strongly interfering or very unaccessible.

From these results it was concluded that Group B children's heightened attachment behavior in the strange situation and proximity seeking during the reunion episodes were the result of a more harmonious relationship which existed between them and their mothers.

Seltzer (1973), in a review of studies concerning patterns of maternal care and their relationships to development in infancy concluded that these studies show the quality of maternal care related to infant IQ, scanning, activity level and such. He saw

several difficulties existing in these studies. The insensitivity of intelligence measures for children less than 3 years old and the ignoring of the child's social-emotional behavior because of an assumption that it was unrelated to cognitive development. He stressed the need to include such social and emotional measures as "expectancy," "motivation," and "schema discrepancy," in such studies, for he saw the possibility of this type variable providing a more sensitive and reliable measure of cognitive development. He identified a need to move beyond the simple observation to experimental-manipulative studies. He identified the enrichment paradigm as being one of the few options open.

Teaching Style

Teaching style is another set of variables that have been found to be important influences on the development of the child. Studies dealing with this set of variables take the form of a structured situation in which the mothers are given cognitive-sorting tasks to teach their children. Such a study was that reported by Hess and Shipman (1965). In this study, 160 black mothers from four social strata (middle-class, upper-lower, lower-lower, and aid to dependent children) were given a cognitive-sorting task to teach to their 4-year-old children. Differences found between the four social strata included the child's level of cognitive functioning and several variables concerning how the mother taught the task. Differences were found in the style of language the mother used, the complexity of her language and the length of her sentences to her child. Hess and Shipman, using Bernstein's 1961 papers (1961a, 1961b) as their theoretical base,

argued that the style of teaching shown by the lower end of the social strata tended to limit the child's responsiveness in new surroundings as well as preventing him from developing a reflective attitude in its day-to-day activities.

In a later study (1967) the same investigators attempted to identify maternal variables which correlated with successful performance on two cognitive-sorting tasks. They examined such maternal-teaching variables as language, motivation techniques, ability to interpret the child's responses and giving the child appropriate feedback concerning performance. Once the mothers understood the tasks, they were given unlimited time to teach them to their child, but were not provided with any teaching methods. Analysis of the results indicated that both mother and child variables were important in determining the success of the child's performance. The mother's abilities to motivate and encourage the child, as well as the child's own intelligence, interest in task, and attitude toward the mother, were highly related to the child's successful completion of the task. The authors found the most successful teaching style to be one which showed specificity of language and an organized and sequential presentation of the material to be learned.

Differences Between Middle- and Lower-Class Mothers

A third area of study concerning mother-child interaction concerns how lower- and middle-class mothers differ in their attitudes and behavior in interaction with their children. Differences have been found both in how important a role the mother sees herself playing in the development of her child and also in the behavior the mother uses in interacting with her child.

Radin and Kamii (1965) examined the problems experienced by disadvantaged black mothers and identified a major goal of any intervention effort to be the changing of the mothers' feelings concerning their impact upon the surroundings both she and her child experience in their every day to day activities. These authors saw intervention as necessarily going beyond teaching only the child. Rather, they saw a need to teach mothers the methods needed to achieve their goals for their children, which actually are very similar to those held by middle-class mothers.

A more recent study by Tulkin and Cohler (1973) attempted to examine the relationships between middle- and lower-class mothers' attitudes (as measured by the Maternal Attitude Scale given in an interview situation) and the behaviors shown by them in interacting with their children. While finding no significant differences in the attitudes held by the mothers, the authors did find a difference in correlations between these attitudes and the actual behavior engaged in by the mother in interacting with her child. There were strong relationships found between attitudes and observed behavior for the middle-class mothers, but none found for the lower-class mothers. The study seemed to point to a conclusion similar to that of Radin and Kamii discussed above. Lower-class mothers, while having goals and aspirations for their children which are similar to those held by a middle-class mother feel helpless in affecting their child's development.

Bee and her colleagues (1969) compared lower- and middle-class mother's language and behavior toward their children in several

different situations. These situations included a "waiting room" where the mothers and children were observed before entering into the two structured problem-solving situations. In these problem-solving situations, the mothers were given tasks to teach to their children and their teaching strategies were observed. Several findings were reported concerning social class differences between mothers. First, stable and significant differences were found in the style of language used in all situations. The definition of style used included variables such as number of words in a sentence and the abstractness of the mother's speech. Secondly, in the two problem-solving situations, the middle-class mothers were found to interrupt less and generally act in a manner which would foster the development of learning sets on the part of the child. Conversely, the lower-class mothers were very disruptive and hardly allowed their children to attempt the task. Finally, while waiting to go into the problem situation, lower-class mothers were found to be less attentive to their children, and more negative and controlling in their interactions with them.

Wandersman (1973), in reviewing the research dealing with maternal behavior from the 1940's up to 1973 identified several differences in style of interaction according to social class. A trend was distinguished showing lower-class mothers as using more authoritarian, coercive, and physically assertive techniques, while middle-class mothers' interactions were characterized as more egalitarian, guiding and verbally oriented. These stylistic differences were seen as being rooted in a greater emphasis in middle-class mothers on responsiveness and reciprocation in interaction.

From the previous review, several conclusions can be drawn. First, the child's surrounding environment does affect his development. Second, these environmental effects can be observed and differentiated. Third, the mother affects her child's development through both her behavior towards him and the relationship that exists between them. Fourth, there seems to be patterns of interaction exhibited by some mother-child dyads that are highly related to measured competence. Fifth, there are differences between mothers that are a function of social class. While these conclusions can be made, several crucial issues remain as to whether these variables can be manipulated in order to allow a child to develop to his maximum potential. The intervention efforts reviewed below have attempted to answer some of these questions.

Intervention Efforts

Intervention efforts have usually been concerned with mothers and children from the lower strata of our socioeconomic system. They have taken two different approaches to working with the target families and children in an attempt to facilitate the latter's development. The first approach reviewed is the group approach, where the mothers and/or children meet in small groups for discussions and activities designed to affect the child's surrounding environment. The second approach reviewed is home visitation. In this approach the agent of intervention visits the family home to work with the child and/or his mother.

Group Programs

Some group programs use small group discussions to train the parents in the use of resource materials made available

to them by the program. One such program, the Toy-Lending Library was developed by Nimnicht (1970, 1972; Rayder and others, 1970). In this program, parents of 3- and 4-year-olds were taught in two-hour group sessions for ten weeks to use educational toys. A comparison of pre- and post-test scores by the children on the locally produced Responsive Environment Test showed that the children had learned a great deal due to their parents' participation in the program.

In other programs, the focus of the group meeting was teaching the mothers childrearing techniques to be used at home in their day-to-day interactions with their children (Karnes, 1969, 1970a, 1970b). Three-and 4-year old children of mothers taught these techniques showed a greater development on traditional cognitive measures, such as S-B, IQ scores and scores on the Illinois Test of Psycholinguistic Abilities.

A specific goal of modification of the mother's language style was the main feature of a group program for 24, 2-year-old children and their mothers (Mann, 1970). In this program the experimental group's children and their mothers received treatment consisting of verbal reinforcement, verbal elaboration, and verbal extension for 1-1/2 hours, two days a week for ten weeks. A second group of mothers received counseling on matters of concern to low-income, black mothers, but no direct help in their language style. A third group received no treatment and was only post-tested. The pre- and post-test results of the two experimental groups showed that the language treatment produced changes in the syntax style of both the children and their mothers.

Home Visit Programs

This approach sends the agent of intervention to the family home to either work directly with the child, or, more commonly, to stimulate interaction between the mother and the child. One program working directly with infants (Schaefer and Aaronson, 1970; Schaefer, 1969) found that infants visited between the ages of 15 to 36 months scored significantly higher than a control group on tests of intelligence after several months of intervention.

Weikart, in his Ypsilanti Preschool Project (1969, 1970), used the home visit technique to augment his comparison of three different preschool curriculums for children 3 years of age and older. These home visits attempted to involve the mothers in the instruction of their children. The results of this project showed no differences in the children's achievement between the three types of curriculum materials (cognitively oriented, language-oriented, and traditional-nursery school units). Because of this lack of differences, it was concluded that any structured curriculum will help the disadvantaged child's development.

A similar mix of group activities for children of preschool age (3 and 4 years old) and home visits was provided by the Early Training Project, reported by Gray and Klaus (1963, 1964, 1970). In this project, culturally deprived preschoolers were given special experiences to help in the development of their intellectual functioning and personal adjustment. These experiences ranged from field trips to language development exercises. The field trips took place during a summer school program in which intensive work

was done with the children concerning variables associated with attitudes and aptitudes conducive to school achievement. In the months during the fall and winter, there were weekly home visits by specially trained home teachers dealing with the development of language and reading skills by the child. While mostly positive results (in terms of S-B and PPVT scores) were reported at the end of the intervention period, a reevaluation at the end of the fourth grade (some three years after intervention had ceased) showed differences between groups were no longer significant.

Another tactic similar to that developed by Nimnicht, but in the home setting rather than the center was developed by Levenstein (1970, 1971a, 1971b). The major thrust of this ongoing program was the demonstration of self-motivating material ("Verbal Interaction Stimulus Materials") to the mother of children 2 years of age and older. These materials' function was to help stimulate verbal interaction between the child and mother. This strategy was also shown to be an effective means of raising the verbal (PPVT) and general (Cattel and S-B) IQ of children.

Even though most of the intervention programs discussed above deal with children over 1-year-old, an expanding emphasis has taken place in the area of infant intervention. The need for intervention during the child's first year has been noted by Hunt in several articles dealing with the rationale for intervention in poverty families (1967, 1971). Meier (Meier and others, 1971), reviewed the research in the area of infant deprivation and developed a convincing argument for such early intervention.

Within this area of home-visitation programs for infants, while intervenors have occasionally been expected to discuss general topics, such as child development and what the mother should expect from her child (Dusewicz, 1972) most programs use their home visitors to demonstrate specific behaviors and specific curriculum materials for the mother to use in working with her infant. One such program, developed by Forrester (1971) had its two intervenors specifically model desired behavior and then reinforce its appearance in the experimental group mothers (n=20). It was shown that such a technique fostered a general improvement over several different areas of the child's development as measured by the Bayley Mental Development Index (BMDI), the Griffiths Scale (Griffiths) and the IPDS.

In a home visit, infant-education program (Lambert, Bond, and Weikart, 1973), 65 mother-infant pairs were assigned to three different treatment levels. In the experimental-treatment level, mothers were visited once a week by a trained home visitor and were helped in the use of a Piagetian curriculum in working with their children. These infants were tested, using the BMDI, the S-B and the locally produced Ypislanti Picture Sorting Inventory (YPSI). The tests were given at four month intervals from the beginning of the program to the end. A second group of mothers, labeled "contrast" were visited (by volunteers for the first half of the program and by paid community representatives in the second half) but had no curriculum presented for their use with their infants. The third group was a control group. This group

was tested on the cognitive scales every four months in a fashion similar to the above two groups, but were not visited in their homes between these assessments.

This program examined the effects on both the mothers and their infants. In post-tests, mothers included in the experimental group were found to be more supportive in their verbal interaction with their infants than either the contrast or control groups. This verbal analysis was accomplished while the mother-infant pairs were in two different structured situations. In the first, the mothers were told that the investigators were interested in how well their children could talk and were asked to attempt to have their children say something. The second situation has the mothers attempt to teach their children a block-sorting task. Both situations were tape recorded and these tapes were subjected to frequency analysis over several different types of verbal behavior on the part of the mother.

The children's development was assessed in three different areas. The children were tested on their cognitive abilities, linguistic development, and motor development. While two of the areas assessed (motor and linguistic development) showed mixed results, the experimental group performed significantly better on the BMDI, S-B and the YPSI than did the other two groups.

Another home-visitation program was developed by Gordon (1967). The sample, over the years, has consisted of several hundred families as contrasted to the generally smaller sample above. In this program several variables were examined in order to see their

relationship to efficient intervention in the life of the infant. This program used its home visitors to demonstrate specific items in a sequential curriculum with the child. Between the weekly visits of the home visitor, the mother was to spend some time each day working with her infant, using the specific tasks as general guidelines to shape their interaction. This project showed that such a technique worked as the children showed better development than did a control group on a Piagetian Scale and a traditional measure of intelligence at age 6 (Gordon and Guinagh, 1974).

Examining his work in developing his general model of home visit parent education, Gordon (1973) concluded that such a program does work, but that there are many questions that must be raised and refinements of the delivery system that must be made. In an attempt to answer some of these questions, a later intervention program for 128 families (Gordon and Jester, 1972) examined several variables and their relationship to aspects of the intervention program. The effect which sex of the child had on the effectiveness of the intervention and the type of interaction taking place within the intervention situation was one variable examined. The question of whether the intervention program should deal directly with the child or indirectly by working with the mother was also examined. A third variable was the effect of education on a home visitor's effectiveness in dealing with the child or with the mothers of the infants. Women with less than two years of college (called "paraprofessionals") were compared to

women with at least a college education (called "professionals") in their ability to facilitate the development of infants. These two groups of home visitors made weekly visits to the mothers and/or children and presented to them a series of learning activities (called "tasks") based on Piagetian principles. The home visitors demonstrated for the mothers in the mother-taught group the use of these tasks in interacting with the babies. In the child-taught group, they worked directly with the child. During the week between visits the mothers in the mother-taught group worked with their children using the tasks as a basis of intervention. In order to examine the home visitors' interaction with the mother and/or child these weekly visits were periodically taped and subjected to structured observation. The infants' development was measured in terms of their ability to successfully complete tasks of the same type as the project's curriculum but at a higher level of complexity and by a traditional measure of intelligence (the BMDI).

In a follow up study of 64 of these families who constituted the half in which the mothers were directly involved (Gordon, 1974), the video tapes from the above project were subjected to systematic observation using scales developed by Watts (Watts, Barnett, and Halfar, 1973) and Escalona (Escalona and Corman, 1971). The child's competence was also reassessed using the Social Abilities Scale (SAS) developed by White (1972). The competence items as well as the observation items were subjected to factor analysis. As a result, several factors were derived from the three observation

schedules (in addition to the two previously mentioned, one from the original project, the Reciprocal Category System) used.

The results of this study on the 53 families for whom data were complete showed that there were stable and consistent patterns of relation between the observation factors and the competence factors. The obtained relationships seemed to be functions of both time and the sex of the infant.

The conclusions suggested that sex was an important factor when discussing the mother-child relationship and its relation to the child's development of competence. Sex seemed to be crucial in determining when the mother-child interaction was most predictive of competence as well as what type of interaction served to predict the child's competence.

Conclusions

From the preceding review of research, several conclusions are possible. First, from the literature on the parent-child relationship there are orderly and observable relationships between the mother's actions toward her child and how her child develops. The mother's behavior has been examined under several rubrics, from the relationship that exists between the mother and her child (Rubenstein, 1967; Ainsworth and Bell, 1971) to the style of teaching the mother uses in helping her child work on a cognitive-sorting task (Hess and Shipman, 1965; 1967). The child's development has been found to have been effected through several different methods of assessment, from purely cognitive measures (Stephens, 1973; Wachs, Uzgiris and Hunt, 1971) to more generalized

definitions of competence which included motivational and social-emotional as well as cognitive abilities on the part of the infant (Watts, Barnett, and Halfar, 1973).

A second conclusion follows from the review of intervention efforts designed to facilitate children's development. While most efforts have been moderately successful in achieving increased cognitive development on the part of the child (Gordon and Guinagh, 1974; Weikart, 1973), they have not attempted in any systematic way to integrate mother-child relationship variables identified as having an impact on the child's development. Instead, they have used a general intervention model wherein a curriculum is devised and used to facilitate the child's development, either in small group discussions or by visits to the home. These curriculums have been based on general theoretical principles, from Piaget's notion of developmental stages (Gordon, 1969a, 1969b; Lambert, Bond, and Weikart, 1973) to a systematic attempt to change the mother's language style in hopes of an indirect effect on the child's language development (Mann, 1970).

While most of the analysis within these projects has been on the level of identifying experimental and control groups and comparing their performance on post-program intelligence assessments, some efforts have been made to look within the experimental group. These efforts have attempted to examine what relationships exist between the children's performance and aspects of both the intervention program and the ongoing mother-child relationships. This within experimental-group analysis has led to the examination of the relationship of parent's attitudes (Herman, 1970) and marital

status (Etheridge, 1971) to the child's success in an intervention program. Another approach to within experimental group analysis is that reported by Lambie, Bond and Weikart (1973). In their program, mother-baby variables within the testing periods were identified in an attempt to determine whether they were predictive of the degree of success the child had in the program. These efforts were largely unsuccessful. In other investigations, this analysis within the experimental group has taken the form of relating the style of interaction between the mother and child to the child's development (Gordon, 1974) as well as examining variables relating to the type of intervention agent working with the mother-child pair (Gordon and Jester, 1972). This last investigation also attempted to examine the effect the sex of the child had on the success of the intervention.

In the attempt to expand the understanding of what actually is occurring in the intervention situation, the present study deals with behavioral aspects of the home visitor's effects on the mother-infant pair. It extends the analysis from the investigation of a categorical variable dealing with the level of training of the home visitor (Gordon and Jester, 1972) to the actual behavior of the home visitor in her interaction with the mother within the intervention situation. Moving toward the analysis of actual behavior of the home visitor will allow a more adequate picture to develop of the influence of variables in the program and the effects on an individual child. Several specific questions are asked in the present investigation. The first is how the home visitor's

interaction with the mother relates to the mother's interaction with her child. Is it possible to predict the latter from the former? Or is the opposite prediction more reasonable? How do these predictions vary as a function of time? Are they the same as the year of intervention progresses, or do they increase?

A second question concerns the relationship between how the home visitor interacts with the mother and the development of the child. Are there orderly and consistent relationships across time similar to those found between mother-child interaction and the child's competence?

A third question deals with the effects of sex on the above relationships. Will predictability between interaction scores vary as a function of the sex of the infant? Will the direct relationship between the home visitor-mother interaction and child competence scores be different for boys as compared to girls?

CHAPTER 3
DESIGN AND ANALYSIS

This chapter will present a description of the sample used, the hypotheses examined, the intervention program which served as the source of the data and the instruments used to collect the data. The analyses performed for each hypothesis will be presented, with some explanation of both the choice of methods used and how they were applied to the data.

Sample

The sample used in this study was drawn from that used in two previous studies; the Instructional Strategies in Infant Stimulation (ISIS, Gordon and Jester, 1972) and the above mentioned Social Roots project. It consisted of 53 families residing in or near Gainesville, Florida. There were 22 boys and 31 girls included and all families met Office of Economic Opportunity guidelines for classification as low income. All parents gave their consent for the videotapes made of them with their children to be used for educational purposes.

The infant and mother dyads were first videotaped when the infant was 13 weeks of age and were last videotaped when the infant was 52 weeks old (± two weeks). This last videotape was of the mother teaching the child a task and was used for the observation in conjunction with the Social Abilities Scale (SAS), to be discussed below. The preceding seven visits, six weeks apart, included the mother, home visitor and the child.

Information concerning the race and sex of the sample is presented in Table 1. Males comprised 42% of the sample, while females made up the remaining 58%. Some 81% of the total sample was black, with similar proportions of black to white for males (77%) and females (84%).

Hypotheses

The following specific null hypotheses are the focus of the present investigation:

1. There will be no prediction possible either from the Mother-baby scores at one visit to the Home visitor-mother scores at the next or from Home visitor-mother scores at one visit to the Mother-baby scores at the next.

2. There will be no significant relationships shown between the home visitor-mother interaction at different videotape sessions and scores of infants on the Competence factor scores identified in the Social Roots project.

Procedures

This study was an extension of the Social Roots project (Gordon, 1974). In this earlier study mother behaviors which related to the development of infant competence were identified. Items from several observation scales were used to observe mother-infant behavior. The items formed five factors and these factors and the items that make them up are presented in Table 2. Similar analyses of the competence measures of the children at 52 weeks of age produced four factors, of which two, "Series" and "Responsiveness," were best predicted by the Observation factors. These factors and the items which make them up are presented in Table 3.

Table 1

Sample Grouped by Sex and Race

Sex	Race		Total
	Black	White	
	n	n	n
Males	17	5	22
Females	26	5	31
Total	43	10	53

Table 2

Mother-Baby Factors

Factor	Loading
I. Performance Orientation	
1. Discourages (Home Scale)	.92
2. Demonstration, explanation, expansion (Home Scale)	.81
3. Mastery (Home Scale)	.72
4. Exploration (Home Scale)	.69
5. Observing (Home Scale)	.65
6. Verbal and Symbolic Learning (Home Scale)	.58
7. Labeling, reading (Home Scale)	.56
8. Visual Pursuit (Home Scale)	.54
9. Differentation of means and ends (Home Scale)	.48
10. Blank Stare (Home Scale)	.41
11. Nonspecific social-output (Escalona)	-.41
II. Mother-Baby Affectional Transaction	
1. Baby warms, baby cools (RCS)	.97
2. Baby warms, mother amplifies (RCS)	.97
3. Baby warms, mother accepts (RCS)	.95
4. Baby warms, mother warms (RCS)	.94
III. Maternal Push	
1. Focusing on task (Home Scale)	.89
2. Encourages (Home Scale)	.82
3. Seeks emotional comfort (Home Scale)	.80
4. Observe (Home Scale)	.72
5. Actively engaging child (Home Scale)	.68
6. Mastery (Home Scale)	.64
7. Observing (Home Scale)	.51
8. Perceptual, spatial and fine motor learning (Home Scale)	.42
IV. Mother-Baby Teaching Transaction	
1. Total mother-baby interaction (RCS)	.92
2. Mother initiates, child responds (RCS)	.87
3. Mother elicits, child responds (RCS)	.49
4. Baby behaves-mother warms, accepts, amplifies (RCS)	.77
5. Mother directs, child responds (RCS)	.46
V. Nonspecific Social Transaction	
1. Blank Stare (Home Scale)	.67
2. Differentiation of means and ends (Home Scale	.49
3. Nonspecific social-output (Escalona)	.45
4. Child directs, mother responds (RCS)	.44
5. Nonspecific social-input (Escalona)	.42
6. Perceptual, spatial and fine motor learning (Home Scale)	-.52

Table 3

Competence Factors

Factor	Loading
I. Compliance	
1. Unwraps cube (BMDI)	.76
2. Dangle ring by string (BMDI)	.73
3. Puts bead in cup (BMDI)	.68
4. Puts 3/more cubes in cup (BMDI)	.57
5. Pushes car along (BMDI)	.54
6. Closes round box (BMDI)	.50
7. Attempts to imitate scribble (BMDI)	.49
8. Uncovers toys (BMDI)	.44
9. Puts cube in cup on command (BMDI)	.44
10. Pats whistle doll, in imitation (BMDI)	.42
11. Stirs with spoon - imitation (BMDI)	.40
12. Noncompliance (SAS)	-.42
II. Series	
1. His part in "Pop goes . . ." (Series)	.80
2. Child makes sound of thing named (Series)	.72
3. Answers questions (Series)	.71
4. Imitates paper folding (Series)	.70
5. Unwraps toy (Series)	.62
6. Cube in cup, on command (BMDI)	.49
7. Points to person named (Series)	.48
8. Buttons into slit (Series)	.46
9. Points to thing named (Series)	-.45
III. Language	
1. Says "Da-Da" (BMDI)	.85
2. Says 2 words (BMDI)	.85
3. Imitates words (BMDI)	.83
4. Responds to verbal request (BMDI)	.61
5. Inhibits on command (BMDI)	.52
6. Listens Selectively (BMDI)	.50
IV. Responsiveness	
1. Places one peg repeatedly (BMDI)	.53
2. Points to thing named (Series)	.52
3. Removes pellet from bottle (BMDI)	.49
4. Inhibits on command (BMDI)	.46
5. Uncovers blue box (BMDI)	.45
6. Repeats performance laughed at (BMDI)	.44

Intervention Program and Data Collection

The videotapes used in this study were recorded in the ISIS project and reexamined in the Social Roots project. The data were collected from observation of videotapes of seven visits per child, approximately six weeks apart. The taping situation included the mother, her child and a home visitor. During this taped visit the home visitor presented to the mother one or two play activities (called tasks) out of a progressive curriculum which the mother could use to structure her interaction with her child. These tasks were developed to facilitate the child's development in the cognitive realm and were based on Piagetian principles. The seven visits were videotaped when the child was 13, 19, 25, 31, 37, 43, 49, and 52 weeks of age. The last visit (at 52 weeks) was part of the assessment of the child's competence and not part of the intervention program. During each of the six weeks between the first seven videotaping sessions, the mother-infant dyads were visited in their homes. These intervening visits followed the same general form as the taped visits. The child's rate of progression through the tasks depended on the home visitors' impression of the child's readiness. During the first visit, the child was examined to determine an appropriate starting point within the series of activities. Thus some children started on the first task in the series while others started much farther along. During the succeeding visits, if the home visitor felt that the child needed more work with a particular task, she continued using it in her work with the mother. If she determined

that the child was ready to move on, she would present to the mother a new task to use in interacting with her child.

Observation instruments. The data for this study were collected using three systematic-observation techniques. Two of these, the Reciprocal Categories System (RCS) and the Watts Home Scale were time based, using 3- and 15-second intervals, respectively. The third, the Escalona Scale, was frequency based.

Reciprocal Categories System. The RCS instrument was adapted for the ISIS project and contains categories to cover verbal behavior on the part of the mother and home visitor and similar categories to classify age-appropriate behavior on the part of the infant. This tryadic analysis was an extension from the instrument's dyadic analysis as it was developed by Ober (1968). While the examined behaviors of the home visitor and mother were strictly verbal, the behaviors coded for the infant were for a large part non-verbal. For example, for categories 24 - or 4 - "Elicits" to be coded for the mother or home visitor, a verbal question was required. For this category to be scored for the infant, some questioning behavior, either verbal ("Uh?") or nonverbal (a quizzical look; a non-verbal appeal for assistance) was deemed sufficient. Because of this characteristic, this instrument missed the non-verbal behavior exhibited by the adults in the situation. A copy of the categories included and the rules used in applying the classification to the observational data are presented in Appendix A.

In using the RCS, the coder would determine who was the central figure of the situation during any particular three-second interval, and what that person was doing in terms of the categories of the system. In this manner, a recorded stream of behavior was obtained. In order to develop a measure of the frequency of types of interaction, the streams of behavior were examined in the following manner. Each behavior coded in a three-second interval was examined in relation to what immediately preceded and followed it. Perhaps in one stream of behavior, the following sequence took place; first, the home visitor asks a question (4 - "Home visitor elicits"), this is then followed by the mother attempting to get some response on the part of the child through playfully asking a question (24 - "Mother elicits") which triggers a response on the part of the child (15 - "Infant responds"). This three-interval stream of behavior would lead to tallies in two different classifications. First, the first two scores would be tallied under the classification 4 - 24, "Home visitor elicits-Mother elicits," the second pair of scores would similarly be tallied under the classification 24 - 15, "Mother elicits-Baby responds." In this manner, every possible interaction between two of the individuals on the tape could be counted for frequency of occurrence.

Graduate students were taught the categories of the RCS. Training sessions were used which consisted of playing practice videotapes and discussing what categories would be scored. The use of videotapes allowed for the reexamination of a behavioral

sequence in order to better determine which categories most accurately described it.

After this training, the reliability between coders was examined by having them examine and code unfamiliar videotapes. Product-moment correlations between the coders' scores were derived covering each of the observation periods. The inter-rater reliabilities obtained in this fashion were .91, .87 and .89 for three tapes.

Items from the RCS were derived by figuring the proportion of a visit spent in a particular type of action. The items which helped make up the mother-baby factors also included summations of several of these individual interactions. For example, item 1 in Mother-baby factor IV, "Total mother-baby interaction" was derived by summing all interaction which included both the mother and baby. This included those interactions when, in a 6-second interval, the mother's behavior occurred first, followed by the baby's; and the opposite interaction, where the baby's behavior was coded first during the six seconds, followed by the mother's behavior.

Variables from the RCS were included on three of the Mother-baby factors. Mother-baby factor I was made up entirely of RCS items. These items were: (1) "Baby warms-Baby cools," (2) "Baby warms-Mother amplifies," (3) "Baby warms-Mother accepts," (4) "Baby warms-Mother warms." Mother-baby factor IV was similarly composed entirely of RCS items. This factor included: (1) "Total Mother-Baby interaction," (2) "Mother initiates-

Child responds," (3) "Mother elicits-Child responds," (4) "Baby behaves-Mother warms, accepts, amplified," and (5) "Mother directs-Child responds." One additional RCS item was included in the Mother-baby scores. This item, "Child directs-Mother responds" is the fourth item on Mother-baby factor V.

Watts Home Scale. The Watts Scale is a structured-observational version of the Human Interaction Scale developed at Harvard (Watts, Barnett, and Halfar, 1973). The present version was the result of collaboration between the original developers at Harvard and the present investigator. It included six general dimensions dealing with (1) the type of activities the mother and infant were participating in, (2) the technique of teaching used by the mother in the activity, (3) an initiation index, showing who had initiated the activity, (4) an encouragement index, recording whether the mother was encouraging or discouraging in her interaction with the infant, (5) a compliance category, examining how the child reacted to directive or restrictive techniques on the part of the mother, and (6) a child behavior category examining what the child's behavior was in his interaction with the mother. A copy of the instrument is provided in Appendix B.

Because the original scale was used in the scoring of written protocols, a system was derived to allow for continuous review of the six demensions by the coders as the taped intervention situation progressed. A coding sheet was developed and a reasonable time frame (15 seconds) established. As a result of this modification, the coders who examined the taped visits decided which of the

categories within each of the six dimensions was most accurate in describing the interaction that took place within a 15-second time period. This task was made somewhat easier by the fact that the compliance categories could only be scored when the mother used a controlling technique. Since this rarely occurred, the compliance dimension was dropped. Another fact that simplified coding was that in the situations being observed, categories within several dimensions often occurred in concert with one another. A score on the category "Encourages" within the Encouragement dimension was often accompanied by activity on the part of the mother which was scored for the "Providing feedback" category within the Technique dimension.

Training on the Watts Scale took some 100 hours. Reliability between the two undergraduate coders after training was 79%. This reliability was the percent agreement by the coders on the items within the six dimensions every 15 seconds.

Items from four of the six dimensions were included in Mother-baby factors I, III, and V. Ten of the 11 items making up factor I are from the Watts scale; including four Child behavior items, (1) "Mastery" (item 3), (2) "Exploration" (item 4), (3) "observing" (item 5) and (4) "Blank stare" (item 10); three Activity items, (1) "Verbal and symbolic learning" (item 6), (2) "Visual pursuit" (item 8) and (3) "Differentiation of means and ends (item 9); two Technique items, (1) "Demonstration, explanation, expansion" (item 2) and (2) "Labeling, reading" (item 7); and one Encouragement item, "Discourages" (item 1).

The third Mother-baby factor was totally composed of Home Scale items. These included: three technique items; (1) "Focusing on task" (item 1), (2) "Observe" (item 4), and (3) "Actively engaging child" (item 5); three Child Behavior items; (1) "Seeks emotional comfort" (item 3); (2) "Mastery" (item 6), and "Observing" (item 7); and one activity item; "Perceptual, spatial and fine motor learning" (item 8).

Of the six items included in Mother-baby factor V, three came from the Home Scale. These included two activity items: "Differentiation of means and ends" (item 2), and "Perceptual, spatial and fine motor learning" (item 6); and one Child Behavior item, "Blank stare" (item 1).

Escalona Scale. The Escalona Scale was made up of the three scales used by Escalona and Corman (1971) in their natural-observation study of two infants. First was the Social Input Scale (Social Input), concerning those inputs provided for the child by the mother. The second was the Social Output Scale (Social Output), concerning what the child provided for the mother during their interaction. The third was the Social Interaction Scale (Interaction Scale), dealing with the reciprocal behavior involving both the infant's and the mother's behavior in their interaction with each other. A copy of the instrument is included in Appendix C.

Because this scale concerned the social environment of the child, a response on its part was essential. This response was seen as signaling the child's awareness of the mother's part in

providing input, receiving output or reciprocating in interaction. Even in Social Input categories, a response by the infant was required for any category to be marked. For example, in order for "Being offered toys or given toys or other things" to be checked, this behavior on the part of the mother must have been followed by some observable response on the part of the infant. These responses took the form of a look by the child towards the mother or some other form that showed the child to be aware of the originator of the behavioral sequence.

The scale was used in conjunction with the present videotapes with no modification from the scale used in Escalona and Corman's project. The decision not to modify the scales was reached by Dr. Escalona while the present investigator was at Yeshiva University collaborating with her.

To avoid contamination across the two new observational instruments, two new coders were recruited and trained for this scale. Because of the lack of a time frame, this system was easier to learn and after 50 hours of training an inter-observer reliability of .80 was achieved. This measure of reliability was obtained by computing the percent agreement between the coders in scoring the same section of videotape.

Items from two of the three schedules included in the Escalona Scale were included in the Mother-baby factor scores. Mother-baby factor I included one item from the Social Output scale, "Non-specific social output" (item 11). Mother-baby factor V included two items from the Escalona Scale; one from the Social

Output scale, "Non-specific output (item 3), and one from the Social Input scale, "Non-specific social input" (item 5).

Competence measures. The Competence factors were developed through the factor analysis of three scales: the Bayley Mental Development Index (BMDI), a traditional intelligence measure; the Series Test, using items based on the same principles as the curriculum used in the intervention, only at an advanced level of complexity; and the Social Abilities Scale (SAS), which examines the child's ability to deal with the social environment. This factor analysis was part of the analyses involved in the Social Roots project. Those items included in the factors were presented in Table 2. Complete copies of the two competence measures unique to this study are presented in Appendix D.

In the analysis of the BMDI the scores used were the child's success or failure on each item. The Series Test was a number of tasks, similar to the project's curriculum but on a higher level of complexity. This test also was included in the factor analysis on an item basis. In this way, different tasks were able to enter into a factor structure with items for the other two scales.

The third competence measure, SAS (White, 1972), was not a test. It was an observation instrument used in the analysis of the last taped visit. This visit included only the mother and her child, with the mother attempting to teach a task which was unfamiliar to her. Through the use of this scale, the child was examined with respect to its ability to use its social surroundings (mainly the mother) as a means to obtain goals it was interested in. Specific

areas of the child's social ability assessed were: (1) its use of the mother as a resource, either as a source for help with clothing and such or as a source for emotional reinforcement; (2) its compliance with the mother's directives, whether they were followed or resisted, and whether the resistance was physical or verbal in form; (3) the manner in which the child showed affection or hostility; (4) whether or not it had pride in the things it made; and (5) whether or not it imitated the mother. Of these areas, only one played any part in the competence factors identified. That item was "Non-compliance" in Competence factor I. This item was negatively loaded on the factor and related inversely to the amount of compliance shown by the child on the other items making up this factor.

Summary of data collected. There were three observational instruments used in the examination of home visitor-mother interaction and mother-baby interaction. These were the Watts Scale, the Escalona Scale, and the RCS. There also were three competence measures used in the assessment of child competence. They included the BMDI, the Series Test, and the SAS.

After the three observational instruments were coded, the items for each were factor analyzed to develop factors of mother-baby interaction. These Observational factors were derived during the Social Roots project. These Mother-baby factors were presented in Table 2. A similar factor analysis was performed on the three competence measures, producing the factors presented in Table 3. This factor analysis was also done in the Social Roots project.

Of the items included in these factors of competence, only one came from the SAS. The rest of the items making up the factors came from the BMDI and Series Test.

The Home visitor-mother scores, derived for this investigation, were three interaction scores of the RCS concerning how the home visitor interacted with the mother. These data had been collected in the ISIS project but had not been examined for the vantage point of the interaction shown between the home visitor and mother. Originally these Home visitor-mother variables included five scores reflecting the RCS items included in Mother-baby factor IV. Two of these five items were dropped, however, due to a lack of occurrence on the part of the home visitor-mother dyad. The remaining three variables are presented in Table 4.

The lack of occurrence for two RCS items for the home visitor-mother dyad can be explained by reference to the explanation of the coding procedures, for this scale. While for the child, any response, whether verbal or behavioral was coded, only verbal responses on the part of the mother or home visitor were coded. This means that while mothers might have responded with a non-verbal response, to "Home visitor elicits," it was not a verbal response and therefore not classified by the RCS. For example, the home visitor might have said, "Why don't you try?" to the mother (4 - Elicits). The mother might have responded by non-verbally imitating the home visitor's actions towards her child. In this imitation, she might say, "Look here baby," and her child might have responded. Because of the lack of a verbal response,

Table 4

Home Visitor-Mother Score Items

1.	Total Home Visitor-Mother Interaction (RCS)
2.	Home Visitor Initiates-Mother Responds (RCS)
3.	Mother Behaves—Home Visitor warms, accepts, amplifies (RCS)

the situation would have been coded: 4 - "Home Visitor Elicits," followed by 24 - "Mother Elicits," followed by 15 - "Infant Responds."

Analyses

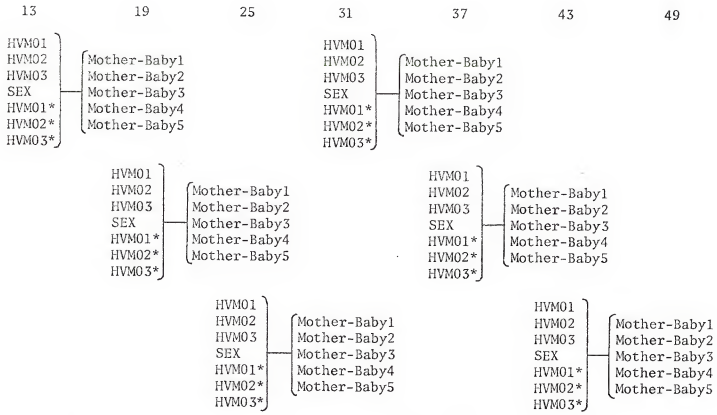
Because of previous findings from the ISIS and Social Roots projects, it was felt that there would be differences due to the sex of the infant in the results obtained for the two hypotheses. Because of this concern, the significance of sex was examined in relation to both hypotheses.

Hypothesis 1. The first hypothesis, in null form, was no prediction would be possible between visits, either from the Mother-baby scores to the Home visitor-mother scores or from the Home visitor-Mother scores to the Mother-baby scores. Two sets of scores were used in testing this hypothesis. First was the Home visitor-mother interaction scores, made up of three RCS home visitor-mother behaviors resembling the items from Observation factor IV for the mother-baby interaction. The last two RCS items from Observation factor IV were dropped for nonoccurrence in the home visitor-mother interaction. These Home visitor-mother scores were shown in Table 4. The second set of scores used in the analysis of this hypothesis was the Mother-baby factor scores for the five factors. The names of the factors and the items they included were presented in Table 1.

In the analysis of this hypothesis, the contribution of sex was examined by use of multiple regression. The multiple regression analyses performed were of two types. First, each

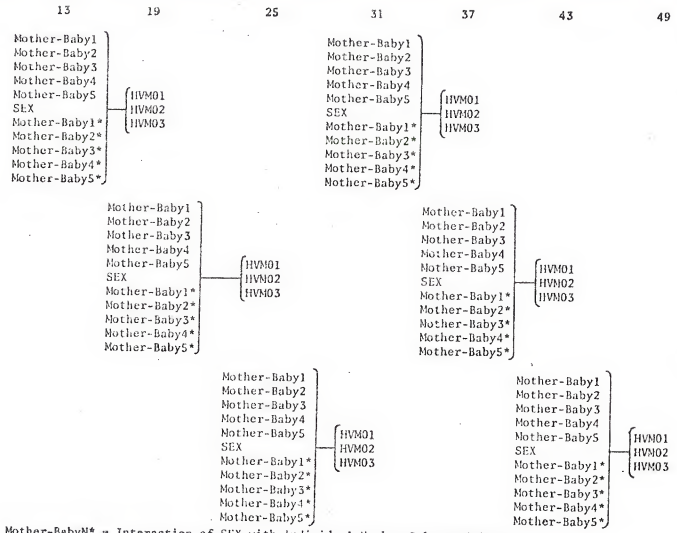
Mother-baby variable was regressed against the Home visitor-mother variables from the previous visit, the sex of the infant, and the interaction of sex with each Home visitor-mother variable. A schematic view of this analysis is presented in Figure 1. Next, a similar type of regression was performed taking the Home visitor-mother scores at a particular visit as the criterion variables regressed against the Mother-baby scores from the previous visit. A schematic view of this analysis is presented in Figure 2.

This examination followed a procedure outlined by Mood (1971). In this procedure, the significance of the terms reflecting the interaction of sex with the independent variables was examined in both sets of multiple-regression equations which attempted to predict later scores from earlier scores. That is, in the case of prediction from Home visitor-mother scores at 13 weeks to the Mother-baby scores at 19 weeks (each Mother-baby variable separately) the sex and sex-interaction terms were included in both types of multiple regression equations. If the variable of sex was a significant predictor, that would mean that knowing the sex of the child would help predict the outcome of the analysis. Although this is a sex effect, it would not require separate analyses for males and females. If on the other hand, the sex-interaction terms significantly improved the equation, that would indicate that the sex of the infant was important in the determination of which variables were related. Because the analyses performed for this hypothesis used the sets of variables and not each variable individually, the concern in this investigation centered on whether separate analyses for each sex were justified.



HVMON* = Interaction of SEX with an individual Home Visitor-Mother variable.

Figure 1. Regression of Mother-Baby Scores from One Visit on the Home Visitor-Mother Scores from the Preceding Visit



Mother-BabyN* = Interaction of SEX with individual Mother-Baby variable.

Figure 2. Regression of Home Visitor-Mother Scores from One Visit on the Mother-Baby Scores from the Preceding Visit

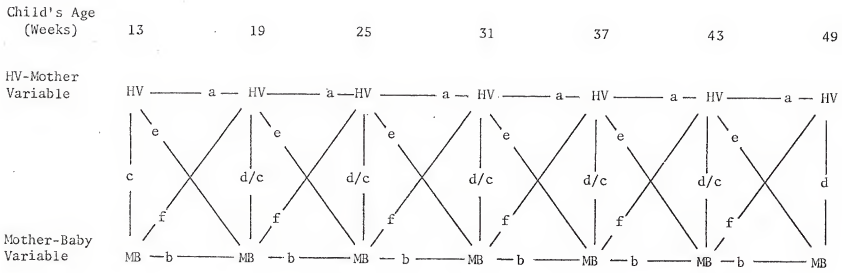
The contribution of the sex-interaction terms was examined by forming an *F* ratio with the numerator containing the mean square of the contribution to the prediction equation by these interaction terms. This mean square was computed by subtracting from the sum of squares regression before the sex-interaction terms were entered the sum of squares after the sex-interaction terms were entered. This difference was divided by the degrees of freedom for the variables being examined (one degree of freedom per variable). The denominator of the *F* ratio was the mean square for the residual after all variables had been entered. This *F* ratio allowed for the examination of the contribution of the sex-interaction terms to the prediction equation.

If the contribution of the sex-interaction terms was significant for most predictions, in either direction (from Home visitor-mother score to Mother-baby scores or vice versa), that would signal a need for separate analyses for the two sexes.

In the analysis of the hypothesis itself, a variation of the cross-lagged panel correlation technique (Campbell and Stanley, 1963; Pelz and Andrew, 1964; Rozelle and Campbell, 1969) was used. Because of the development of this technique, inferring relationships of influence from correlational data has become possible. This method is based on the time precedence rule of inference. In every science, when a given event consistently precedes the occurrence of another, and the reverse is not true, only two possibilities are entertained. Either the first event is seen as an influence (probably one of many) of the second event or both events are influenced by some more general, unknown cause.

The negation of this second alternative is the aim of all experimental design. By controlling the application of the independent variable, the experimenter is assured that its occurrence is not dependent on some more general prior event, and thus any differences occurring between experimental and control subjects can be attributed to the presence or absence of the independent variable. In this manner, the second alternative, concerning both events being the effects of some more general cause, becomes implausible.

This concept of time precedence affects the cross-lagged panel correlation technique in the following manner. While a single correlation between two measures at one time can only measure the strength of a relationship between these two variables, when panel data are available, there is a basis for determining relationships of influence. Panel data are measures of two variables, at two or more points in time. The panel data available from the present study are shown in Figure 3. In the first panel there are the Home visitor-mother scores at 13 weeks and 19 weeks, and similar measures of the Mother-baby variables at the same times. Because of the availability of this panel data, some six correlations could be computed; the two lagged autocorrelations (rHV13HV19 and rMB13MB19) two simultaneous cross correlations (rHV13MB13, rHV19MB19) and two cross-lagged correlations (rHV13MB19, rMB13HV19). The comparison of the cross-lagged correlations is crucial for inference of the direction of influence. There are three possible relationships which might exist between the two correlations of Home



a = r HVn to HVn+6
b = r MBn to MBn+6
c = r HVn to MBn
d = r HVn+6 to MBn+6
e = r HVn to MBn+6
f = r MBn to HVn+6

Figure 3. Panel Data Available and Resulting Correlations

visitor-mother and Mother-baby scores, from one visit to the next. For example, if high scores on the Home visitor-mother variables at 13 weeks were followed by high Mother-baby variable scores at 19 weeks, but the converse not true (i.e. high Home visitor-mother scores at 13 weeks were not consistently followed by high Mother-baby scores at 19 weeks) then it should follow that rHV13MB19 would be greater than rMB13HV19. If on the other hand, high Mother-baby variable scores at 13 weeks were consistently followed by high Home visitor-mother scores at 19 weeks, then the pattern of correlational differences would be reversed (rMB13HV19 less than rHV13MB19). If either of the above results was obtained, there would be a basis for statements concerning the direction of influence. The presence or change in a variable (e.g. Home visitor-mother scores) consistently followed by a change in status (either a gain or loss) of another variable (Mother-baby scores) satisfies the time precedence notion of causality (Crano, Kenney, and Campbell, 1972) and would be the basis for statements concerning the direction of influence between two variables. The differences shown between correlations would show which variable's change occurred first and how it affected the other variable. The direction of the inequality between the two cross-lagged correlations would show which variable had priority in the relationship. This finding would not, however, rule out reciprocity in the relationship. In other words, it would be possible that both variables were part of a reciprocal relationship, where how either variable changed at one time would trigger changes in the other variable.

The inequality between the two cross-lagged correlations would, however, provide information concerning which of the variables' effects on the other were stronger.

The third possible finding would be no difference between the two cross-lagged correlations. This could be the result of either of two possible relationships. The first is that there exists no causal link between the variables. The second is that both of these changes in the variables are the results of another, more general causal influence.

While the cross-lagged correlations would be crucial to the determination of which of the variables was more influential, the other four correlations provide information concerning the relationship between the two variables. The lagged autocorrelations (rHVn to HV n+6 and rMBn to MBn+6) provide information as to how reliable each of the measures was. The simultaneous-cross correlations (rMBn to HVn and rMBn+6 to HVn+6) would show how closely related the two measures were at one point in time. These correlations help in the examination of the cross-lagged correlations. If the reliability of measures was low (as shown by lagged autocorrelations), less can be made of the relationship shown by a high cross-lagged correlation. If the measures were reliable, then the cross-lagged correlations would be better indicators of a true relationship of influence. Similarly, if the simultaneous-cross correlations were high, that would signal a situation where the two variables were related and allow for statements of influence to be made. If the simultaneous-cross correlations were very low, that would signal a

situation where the two variables were not related and again attack the validity of the cross-lagged correlations.

This technique has been used in several studies of the relationship between intelligence and achievement (Crano, 1973; Crano, Kenney and Campbell, 1972; Dyer and Miller, 1974). While these studies have used standardized tests of the two variables examined, the present study dealt with observational measures of interaction. Since these observational measures were not standardized tests as were the measures of intelligence and achievement used in the previously reported studies, correlations between them individually are open to question. There is the question of the individual measures' reliability across samples. It was not know whether the individual measures would do as good a job in tapping the aspects of interaction for other samples of home visitor-mother-infant tryads as they did for this sample.

A second, more crucial question concerned whether or not the individual measures were valid in their characterization of the aspects of interaction they attempted to capture. Were they capturing those aspects of the home visitor-mother or mother-baby interaction they were supposed to? Was that all they were capturing, or were other aspects of the situation affecting the coding of the behavior? Instead of having completely valid, reliable measures of individual variables within each area of interaction, it was felt the measures' value was on a composite level, with the sets of variables doing an adequate job of capturing the two sorts of interaction under scrutiny. Because of this concern, a modification

of the cross-lagged correlation was seen as appropriate. In this modification, a form of canonical correlation was used in place of the crucial cross-lagged correlations.

Since canonical correlations are measures of relationship between canonical variates (scores predicted by the entire set of variables) and not the variables themselves, they cannot be interpreted as the amount of variance predicted in one set of variables given the other (as squared correlations can). If the cross-lagged panel correlation technique was to be appropriately used, such an index of predicted variance was required. A method of deriving this measure has been developed by Stewart and Love (1968). This index can be considered in the same manner as a normal squared correlation coefficient between single variables. In its development, the amount of variance a canonical variate extracts from a set of variables is determined and then multiplied by the squared canonical correlations for each variable within the set. The measure that results from summing the resulting values is the amount of variance in one set of variables that can be predicted from the other.

In examining the question of influence, two separate indices for each visit were compared. First, the amount of variance in the Mother-baby scores at a visit predictable from the variance in the Home visitor-mother scores at the preceding visit was calculated. Second, a similar index was obtained for the amount of variance in the Home visitor-mother scores at a visit predictable from the Mother-baby scores at the preceding visit. A schematic diagram of these two indices is presented in Figure 4.

INDEX FOR

AMOUNT OF VARIANCE IN THE SET OF MOTHER-BABY

VARIABLES AT TIME N + 6 WEEKS WHICH IS PREDICTED

BY VARIANCE IN THE SET OF HOME VISITOR-MOTHER VARIABLES

AT TIME N WEEKS.

COMPARE

INDEX FOR

AMOUNT OF VARIANCE IN THE SET OF HOME VISITOR-MOTHER

VARIABLES AT TIME N + 6 WEEKS WHICH IS PREDICTED

BY VARIANCE IN THE SET OF MOTHER-BABY VARIABLES

AT TIME N WEEKS.

Figure 4. Comparison of Indices of Redundancy

If one index is larger than the other, this indicates the set of variables being used as the predictor in that index does a better job of predicting than does the other. Because of this feature, the Stewart and Love index of redundancy is a measure that can be appropriately substituted for a squared correlation coefficient in the cross-lagged panel correlation technique. Some caution, however, is needed in the interpretation of these indices. Because the indices obtained concern each set of variables and variables within a set, it is impossible to develop specific conclusions concerning the relationships between individual Home visitor-mother and Mother-baby variables. What is possible is the development of general conclusions concerning the relationships which exist between the overall mother-baby and home visitor-mother interaction.

Hypothesis 2. In its null form, the second hypothesis was that there would be no significant relationships shown between home visitor-mother interaction at different videotape sessions and scores of infants on the Competence factors identified in the Social Roots project. These Competence factors and the items which make them up were presented in Table 3.

This hypothesis was examined through the use of canonical correlation. The set of Home visitor-mother variables at each taping session was correlated with the set of Competence factor scores. In this manner, it was possible to examine how the two sets of variables related overall. Further analyses were indicated wherever significant canonical correlations between the Home

visitor-mother scores and the Competence factor scores were obtained. A schematic view of the canonical correlations calculated is presented in Figure 5.

The next step after a significant canonical correlation was obtained was the use of multiple regression to examine the contribution of the sex-interaction terms to the predictive ability of the Home visitor-mother variables. In this examination, a procedure outlined in relation to the first hypothesis (Mood, 1971), concerning the partitioning of variance in multiple regression, was used. In this particular case, the variable of sex alone and the three Home visitor-mother variables were forced into the regression equation first, with the terms reflecting the interaction of sex and the Home visitor-mother variables entering last. A schematic view of this regression analysis is presented in Figure 6. An F ratio was formed with the numerator containing the mean square of the contribution to the prediction equation by the interaction terms, and the denominator the mean square for the residual after all variables had been entered. The resulting F ratio had the degrees of freedom equal to the two mean squares. The significance of this F ratio allowed for the examination of the contribution of the sex-interaction terms to the prediction of Competence factor scores, one at a time. The results of this analysis determined the form of the next multiple regression.

If the sex-interaction terms significantly increased the prediction ability of the Home visitor-mother variables at a particular session, separate analyses were performed for boys and

13		19		25		31		37		43		49	
HV/M01		HV/M01		HV/M01		HV/M01		HV/M01		HV/M01		HV/M01	
HV/M02		HV/M02		HV/M02		HV/M02		HV/M02		HV/M02		HV/M02	
HV/M03	COMPTI	HV/M03	COMPTI	HV/M03	COMPTI	HV/M03	COMPTI	HV/M03	COMPTI	HV/M03	COMPTI	HV/M03	COMPTI
SEX	COMPTII	SEX	COMPTII	SEX	COMPTII	SEX	COMPTII	SEX	COMPTII	SEX	COMPTII	SEX	COMPTII
HV/M01*	COMPTIII	HV/M01*	COMPTIII	HV/M01*	COMPTIII	HV/M01*	COMPTIII	HV/M01*	COMPTIII	HV/M01*	COMPTIII	HV/M01*	COMPTIII
HV/M02*	COMPTIV	HV/M02*	COMPTIV	HV/M02*	COMPTIV	HV/M02*	COMPTIV	HV/M02*	COMPTIV	HV/M02*	COMPTIV	HV/M02*	COMPTIV
HV/M03*		HV/M03*		HV/M03*		HV/M03*		HV/M03*		HV/M03*		HV/M03*	

HV/MON* - Interaction of SEX and HV/MON.

Figure 5. Canonical Correlations Between Home Visitor-Mother Variables at Each Taped Session and Competence Factors

	13	19	25	31	37	43	49
COMPETENCE I	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*
COMPETENCE II	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*
COMPETENCE III	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*
COMPETENCE IV	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*	SEX HVM01 HVM02 HVM03 HVM01* HVM02* HVM03*

HVMON* = Interaction of SEX with an Individual Home Visitor-Mother Variable.

Figure 6. Multiple Regression of Home Visitor-Mother Variables to Child Competence Scores to Examine Contribution of Sex Interaction Terms

girls. If the interaction of sex with Home visitor-mother variables was not found to significantly increase the predictive ability of the Home visitor-mother variables, a second multiple regression was performed on the total sample, with no distinction made on the basis of sex. This second set of multiple regressions, whether for the total sample or for each sex separately, provided information as to what types of relationships existed between the individual Home visitor-mother variables and the Competence factors.

CHAPTER 4
RESULTS

The results of the analyses described in the previous chapter are now presented. Before the results are presented, the means and standard deviations of the variables used are presented. The results of the analyses concerning the appropriateness of separate analyses for males and females are presented with the results of the two hypotheses themselves.

Means and Standard Deviations

The means and standard deviations of the variables are presented in Tables 5 through 10 in the order of their use in the analyses of the hypotheses. Tables 5, 6, and 7 contain the means and standard deviations for Home visitor-mother variables at each time period, for the total sample and for each sex. These scores are proportional measures and are less than 1.0. They are the proportions of the total time in a particular videotaped visit which was spent in that activity. Time periods which have no means and standard deviations for a particular variable indicate that none of this type of behavior was coded as occurring in those taped visits. Examples of this are found at the 43-week and 49-week visits for the boys on the variable "Home visitor initiates-Mother responds" (Table 6).

Table 5

Means and Standard Deviations for Home Visitor-Mother Variables
(Total Sample)

Variables	13 Weeks Mean	13 Weeks S.D.	19 Weeks Mean	19 Weeks S.D.	25 Weeks Mean	25 Weeks S.D.	31 Weeks Mean	31 Weeks S.D.	37 Weeks Mean	37 Weeks S.D.	43 Weeks Mean	43 Weeks S.D.	49 Weeks Mean	49 Weeks S.D.
1. Total Home Visitor-Mother Interaction	.136	.071	.155	.079	.156	.080	.137	.066	.109	.055	.115	.070	.095	.057
2. Home Visitor Initiates-Mother Responds	.001	.002	.002	.004	.001	.001	.001	.002	.001	.001	.001	.001	.001	.001
3. Mother Behaves-Home Visitor Warms, Accepts, Amplifies	.009	.011	.011	.012	.015	.018	.010	.011	.009	.015	.010	.015	.006	.009

Table 6

Means and Standard Deviations for Home Visitor-Mother Variables
(Males)

Variables	13 Weeks		19 Weeks		25 Weeks		31 Weeks		37 Weeks		43 Weeks		49 Weeks	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
1. Total HV-Mother Interaction	.136	.057	.142	.069	.135	.067	.112	.061	.112	.065	.104	.064	.075	.047
2. HV Initiates-Mother Responds	.001	.002	.001	.003	.001	.001	.001	.002	.001	.001	.000	.000	.000	.000
3. Mother Behaves-HV Warms, Accepts, Amplifies	.010	.011	.011	.015	.014	.015	.008	.008	.011	.018	.013	.020	.006	.010

Table 7

Means and Standard Deviations for Home Visitor-Mother Variables
(Females)

Variables	13 Weeks		19 Weeks		25 Weeks		31 Weeks		37 Weeks		43 Weeks		49 Weeks	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
1. Total HV-Mother Interaction	.136	.080	.164	.086	.164	.085	.156	.065	.106	.047	.125	.075	.110	.061
2. HV Initiates-Mother Responds	.001	.002	.003	.005	.001	.002	.001	.001	.000	.000	.001	.001	.001	.001
3. Mother Behaves-HV Warms, Accepts, Amplifies	.009	.011	.010	.008	.015	.019	.012	.013	.008	.008	.008	.010	.006	.009

Table 8

Means and Standard Deviations for Mother-Baby Variables
(Total Sample)

Variables	13 Weeks Mean	13 Weeks S.D.	19 Weeks Mean	19 Weeks S.D.	25 Weeks Mean	25 Weeks S.D.	31 Weeks Mean	31 Weeks S.D.	37 Weeks Mean	37 Weeks S.D.	43 Weeks Mean	43 Weeks S.D.	49 Weeks Mean	49 Weeks S.D.
1. Performance Orientation	.449	.566	.148	.756	.015	1.01	.183	.749	-.43	1.33	.054	.689	.086	.644
2. Mother-Baby Affectional Transaction	.003	.008	.004	.006	.003	.004	.002	.003	.003	.006	.003	.006	.002	.005
3. Maternal Push	.755	.638	.793	.544	.600	.457	.649	.428	.705	.472	.668	.431	.708	.519
4. Mother-Baby Teaching Transaction	.185	.169	.222	.150	.217	.174	.245	.191	.329	.260	.282	.204	.289	.182
5. Nonspecific Social Transaction	.626	.778	1.18	1.42	1.00	1.73	1.11	1.26	1.67	1.86	1.06	1.24	.867	1.10

Table 9

Means and Standard Deviations for Mother-Baby Variables
(Males)

Variable	13 Weeks Mean	13 Weeks S.D.	19 Weeks Mean	19 Weeks S.D.	25 Weeks Mean	25 Weeks S.D.	31 Weeks Mean	31 Weeks S.D.	37 Weeks Mean	37 Weeks S.D.	43 Weeks Mean	43 Weeks S.D.	49 Weeks Mean	49 Weeks S.D.
1. Performance Orientation	.394	.567	-.04	.849	-.07	.813	.225	.466	-.23	1.26	.266	.556	.001	.661
2. Mother-Baby Affectional Transaction	.002	.005	.002	.004	.002	.004	.002	.003	.002	.006	.004	.008	.001	.004
3. Maternal Push	.688	.410	.909	.556	.436	.432	.513	.419	.788	.456	.751	.420	.628	.498
4. Mother-Baby Teaching Transaction	.162	.127	.224	.164	.159	.157	.196	.182	.340	.236	.313	.210	.264	.179
5. Nonspecific Social Transaction	.550	.811	1.55	1.62	.653	1.18	.785	1.14	1.52	1.86	1.03	1.15	.826	1.12

Table 10

Means and Standard Deviations for Mother-Baby Variables
(Females)

Variable	13 Weeks Mean	13 Weeks S.D.	19 Weeks Mean	19 Weeks S.D.	25 Weeks Mean	25 Weeks S.D.	31 Weeks Mean	31 Weeks S.D.	37 Weeks Mean	37 Weeks S.D.	43 Weeks Mean	43 Weeks S.D.	49 Weeks Mean	49 Weeks S.D.
1. Performance Orientation	.490	.551	.264	.655	.080	1.11	.150	.899	-.62	1.33	-.10	.723	.161	.607
2. Mother-Baby Affectional Transaction	.004	.009	.005	.007	.003	.005	.002	.003	.004	.006	.002	.003	.003	.005
3. Maternal Push	.805	.752	.724	.515	.721	.429	.756	.394	.632	.465	.607	.422	.779	.517
4. Mother-Baby Teaching Transaction	.203	.190	.222	.154	.261	.170	.284	.186	.318	.274	.259	.202	.311	.179
5. Nonspecific Social Transaction	.683	.732	.961	1.21	1.25	1.98	1.37	1.27	1.80	1.81	1.04	1.28	.904	1.06

The means and standard deviations for the Mother-baby factor scores at each time period are presented in Tables 8, 9 and 10. Because these are factor scores, in which the individual item scores were added after being given the sign of their loading, there is the possibility of negative means. The only variable having a negative mean is the first, "Performance Orientation." Negative means occur for the total population on this variable at the 37-week visit; for males on the 19-, 25-, and 37-week visits, and for females on the 37- and 43-week visits. These negative means are the result of the high frequency of occurrence of item 11, "Nonspecific Social Output," since this item was negatively related to the factor structure (see Table 2) and occurred more frequently than all other items combined.

The child's competence was indicated by the scores on the Competence factors. These Competence factors were derived in a manner similar to that used for the Mother-baby factor scores. Table 11 presents their means and standard deviations.

Hypotheses

Hypothesis 1

The first hypothesis was that no prediction would be possible, either from Mother-baby scores at one time to Home visitor-mother score at the next or from Home visitor-mother scores at one time to Mother-baby scores at the next. Before the results concerning this hypothesis are reported, preliminary results concerning the justification for separate analyses for the two sexes are considered.

Table 11

Means and Standard Deviations for Competence Factors

Factor	Males		Females		Total	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
1. Compliance	6.36	2.854	6.300	3.544	6.327	3.240
2. Series	4.909	2.759	5.000	2.586	4.962	2.634
3. Language	1.000	1.447	2.033	1.974	1.596	1.829
4. Responsiveness	1.546	1.184	2.033	1.732	1.827	1.530

As was stated in the design chapter, the interaction of sex with the independent variables was examined by forcing the terms reflecting this interaction into multiple regression equations last, after all other variables were included. The results of this process are given in Tables 12 and 13.

The F ratios obtained for the interaction of sex with the three Home visitor-mother variables are presented in Table 12. Six of the eight are significant to the .01 level. This indicates a need for separate analyses on the basis of sex.

Table 13 shows less encouraging results with only one of the nine F ratios significant to the .05 level. There is a problem with these data, in that the variance left in the Home visitor-mother interaction scores after the shared variance accounted for by each of the other Mother-baby variables was removed, was so small that six of the nine equations did not allow for the examination of the separate contribution of the interaction of sex.

The results of the analysis concerning the appropriateness of the separate anlayses by sex are mixed. There seems to be sex interaction working in the prediction of Mother-baby factor scores by Home visitor-mother interaction scores, but the opposite prediction is not open to examination. Because of the definite interaction found in the one prediction and the lack of real results in the other, the sexes were examined separately for both predictions.

In order to examine the question dealing with the predictive ability of the two sets of scores, the index of reduncancy discussed

Table 12

Contribution of Sex Interaction to Significant Prediction Equations
(Home Visitor-Mother to Mother-Baby)

Sex Interaction in Comparison	MO-BA(1)	MO-BA(2)	MO-BA(3)	MO-BA(4)	MO-BA(5)
13-19					F = 4.82 * (3,44)
19-25				F = 16.923 * (3,44)	
25-31	F = 1.38 (3,40)				
31-37	F = 10.58 * (3,39)				F = 0.286 (3,39)
37-43	F = 117.784 * (3,35)			F = 18.895 * (3,35)	
43-49	F - 103.163 * (3,39)				

* = p .05

Table 13

Contribution of Sex Interaction to Significant Prediction Equations
(Mother-Baby to Home Visitor-Mother)

Sex Interaction in Comparison	HV-MO(1)	HV-MO(2)	HV-MO(3)
13-19		No F Possible	
19-25	F = 1.95 (5,32)	No F Possible	
25-31	F = 2.60 * (5,25)	No F Possible	No F Possible
31-37	F = 2.50 (5,25)	No F Possible	No F Possible
37-43			
43-49			

* = p .05

previously was determined from several standpoints. These sets of redundancies are presented in Table 14 for the males, and Table 15 for the females. Both tables are in the same form, with the first set of redundancies showing the redundancy in the set of Home visitor-mother variables, given the set of Mother-baby variables. The second set in each table shows the redundancies of variance in the Mother-baby variable set, given the set of Home visitor-mother variables. The first line within both sets shows the simultaneous-cross redundancies, measuring the amount of variance which is redundant between the two sets of variables at the same point in time. The second line shows the critical cross-lagged redundancies. These redundancies provide information concerning the prediction of one set of variables given the other. The third line shows lagged autoredundancies. These redundancies show the reliability of the sets of variables. By considering these third lines in the four sets of redundancies (two for males, two for females), it is possible to determine the overall reliability of the two sets of variables. If it is recalled that the index of redundancy is similar to a squared correlation coefficient, in that it is a measure of the variance in one set of variables predicted from the other set, it seems that the two sets are fairly reliable across time. All lagged autoredundancies seem adequate except those for females from 25 to 31 and 31 to 37 weeks for the Home visitor-mother set and for the males on the Home visitor-mother 43 to Home visitor-mother 49 weeks comparison.

Table 14

Simultaneous-Cross, Lagged-Auto and Cross-Lagged Indices of Redundancy Between Mother-Baby and Home Visitor-Mother Variable Sets (Males)

TO HOME VISITOR-MOTHER

	HV-MO 13	HV-MO 19	HV-MO 25	HV-MO 31	HV-MO 37	HV-MO 43	HV-MO 49
Mother-Baby Simultaneous	.3020	.3435	.5688	.2481	.2104	.1518	.4521
Mother-Baby n=6		.1043	.2597	.5066	.6141	.1350	.3699
Home Visitor-Mother n=6		.1659	.1875	.3628	.1110	.2505	.0601

TO MOTHER-BABY

	MO-BA 13	MO-BA 19	MO-BA 25	MO-BA 31	MO-BA 37	MO-BA 43	MO-BA 49
Home Visitor-Mother Simultaneous	.1921	.2527	.3658	.1784	.2474	.0579	.1872
HV-Mother n=6		.1482	.1258	.1740	.1565	.1736	.0528
Mother-Baby n=6		.3832	.2191	.3735	.3595	.3970	.1623

Table 15

Simultaneous-Cross, Lagged-Auto and Cross Lagged Indices of Redundancy Between Mother-Baby and Home Visitor-Mother Variable Sets (Females)

TO HOME VISITOR-MOTHER

	HV-MO 13	HV-MO 19	HV-MO 25	HV-MO 31	HV-MO 37	HV-MO 43	HV-MO 49
Mother-Baby Simultaneous	.2001	.3334	.2061	.3165	.2128	.1323	.2430
Mother-Baby n=6		.2592	.3075	.2124	.1172	.0796	.2178
Home Visitor-Mother n=6		.1996	.1609	.0764	.0876	.1667	.2890

TO MOTHER-BABY

	MO-BA 13	MO-BA 19	MO-BA 25	MO-BA 31	MO-BA 37	MO-BA 43	MO-BA 49
Home Visitor-Mother Simultaneous	.1224	.1621	.1743	.0956	.0920	.0806	.1446
Home Visitor-Mother n=6		.1949	.1792	.0980	.1126	.0910	.1492
Mother-Baby n=6		.1261	.1774	.1335	.3062	.3834	.2614

An indication of the overall relationship which exists between the two sets of variables is given in the first lines of the four sets of redundancies. These simultaneous-cross redundancies show the amount of variance in one set of variables which is redundant, given the other set. In these redundancies, the Mother-baby variables seem the more predictive of the two sets of variables.

The second line within the four sets of redundancies, showing the redundancy in variance in a set at one time, given the other set at the previous time, shows the Mother-baby variable set being the more predictive. The proportion (75%) of comparisons in which the mother-baby interaction was more predictive of home visitor-mother interaction indicated that how the mother interacted with the child was generally influential to the amount of home visitor interaction with the mother. This finding does not, however, completely rule out a reciprocal relationship. It is possible, and indeed probable, that the home visitor-mother interaction also affected the extent of the mother-baby interaction. What is shown by the proportion of comparisons in this direction is that the amount of mother-baby interaction is a better predictor of the amount of home visitor-mother interaction than the converse.

Mother-baby scores for females were more predictive in five out of six comparisons; for the males, four out of six comparisons showed the Mother-baby scores to be more predictive. These findings, for each sex separately, showed that mother-baby interaction was the more influential set of variables.

Although the mother-baby interaction is more predictive, for both males and females, differences exist concerning the amounts of variance predicted. These differences are shown in Figure 7. Although the amount of variance predicted was close to being equal in both directions for the females, the males showed large differences in the variance predicted between the two directions at three of the six times. These differences are presented in Table 16. Examination of this table makes it apparent that greater differences in the amount of variance predicted by the Mother-baby variables occur for the males.

Because of these findings, the null hypothesis, stating that no relationship would be found between the two sets of variables, was rejected. Relationships were found, with the number and direction favoring a position of influence for the Mother-baby variables.

Hypothesis 2

The second hypothesis had two parts: (1) there would be no significant relationships shown between home visitor-mother interaction at different videotape sessions and scores of infants on the Competence factors identified in the Social Roots project; and (2) these direct relationships would not vary in intensity and kind as a function of time.

In the analysis of this hypothesis, the existence of significant direct relationships between the sets of home visitor-mother interaction and Competence factor scores had to be sustained before the effect of sex on these relationships could be

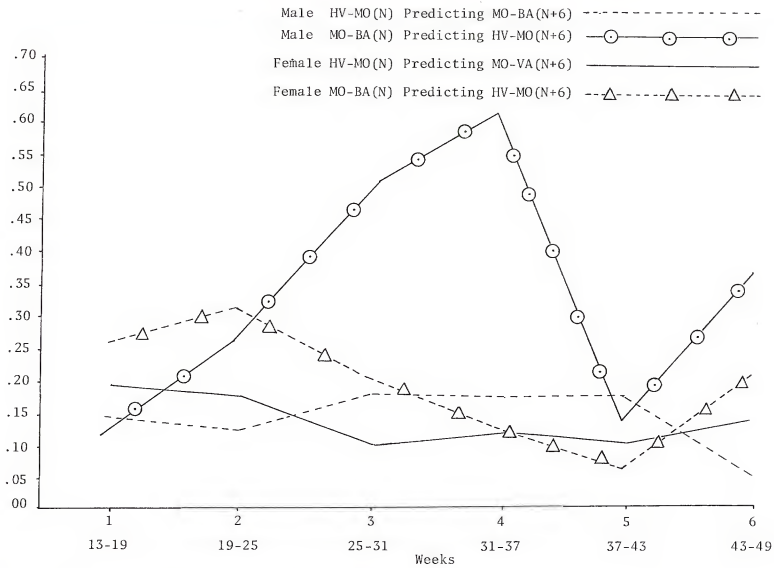


Figure 7. Amounts of Variance Predicted by Mother-Baby Scores at One Visit in Home Visitor-Mother Scores at the Next and by Home Visitor-Mother Scores at One Visit in the Mother-Baby Scores at the Next

Table 16

Differences in Prediction Values Obtained in Males and Females

	Comparison	1 13-19	2 19-25	3 25-31	4 31-37	5 37-43	6 43-49
Male	Best Prediction	HV/MO	MO/BA	MO/BA	MO/BA	HV/MO	MO/BA
	Difference in Variance Predicted	+.04	+.12	+.34	+.45	+.04	+.31
Female	Best Prediction	MO/BA	MO/BA	MO/BA	MO/BA	HV/MO	MO/BA
	Difference in Variance Predicted	+.06	+.12	+.12	+.004	+.02	+.07

examined. In order to examine these general relationships, canonical correlations were computed between the set of Home visitor-mother variables at each visit and the set of Competence factor scores.

The results of the canonical correlations are presented in Table 17. From the examination of this table, it is apparent that none of the canonical correlations obtained were significant. Because of this lack of significant findings, no further analyses were undertaken.

Based on the results of the analyses for this hypothesis, the null hypothesis was not rejected. It can be concluded that, for these data, no significant relationships exist between home visitor-mother interaction and the development of competence by the child.

Table 17

Canonical Correlations
Between Home Visitor-Mother Scores
and Competence Factor Scores

Visit #	Canonical Variable	Canonical Correlation	Chi-Square	df	Probabilty Greater than Chi-Square
13	1	.2299	27.7939	28	.4755
	2	.2604	12.8205	18	.8027
	3	-.1308	6.2638	10	.7937
	4	-.0638	2.9130	4	.5753
19	1	.5823	30.7138	28	.3297
	2	.4153	12.9100	18	.7975
	3	.2907	4.7704	10	.9062
	4	.1497	.9746	4	.9126
25	1	.4852	23.1502	28	.7259
	2	.4558	11.8770	18	.8540
	3	.2037	2.0961	10	.9950
	4	.0865	.3154	4	.9857
31	1	.5140	25.0926	28	.6231
	2	.4193	12.5141	18	.8202
	3	.2668	4.5862	10	.9171
	4	.1932	1.5600	4	.8179
37	1	.6276	32.1358	24	.1234
	2	.5107	13.3641	15	.5748
	3	.1939	2.0321	8	.9790
	4	.1255	.5958	3	.8959
43	1	.5236	27.7289	24	.2713
	2	.4742	13.7909	15	.5419
	3	.2183	2.7090	8	.9507
	4	.1155	.5846	3	.8983
49	1	.5320	31.3779	24	.1429
	2	.4136	15.9059	15	.3882
	3	.3266	7.1837	8	.5179
	4	.2021	1.9385	3	.2021

CHAPTER 5
DISCUSSION AND CONCLUSIONS

A discussion of the results of the analyses performed is presented for the two hypotheses. Aspects of the obtained results dealing with the effects of sex and the interaction of sex and time are highlighted. Suggestions for further research are given and some indication given as to possible research methodologies. Finally, general conclusions are drawn from an overall consideration of the results of this study.

Hypothesis 1

The first hypothesis, stated in null form, was that no relationships would be found between the variables characterizing the home visitor-mother interaction and those characterizing the interaction between the mother and her infant. This hypothesis was rejected; relationships were found between the two sets of variables. Although some prediction was possible from the home visitor-mother interaction, it was consistently overshadowed by the prediction from the interaction of the mother and baby to the interaction between the home visitor and mother. This direction of influence was not one which was expected. Instead, it was assumed that, at least for the interaction observed in this structured-teaching situation, the interaction between the home visitor and mother would have more influence on the mother-baby interaction.

Once the wider "ecological" (Bronfenbrenner, 1974) situation is considered, however, this finding is not unreasonable. The home visitors interacted with the mother-infant dyads for an hour or less a week, while the mothers and children interacted for 16 hours per day, 365 days a year. They interacted across a wide range of situations, from their everyday activities to caretaking episodes. Because of this ongoing, ever-evolving pattern of interaction, the relationships between the mothers and children brought to the teaching situation were not open to extensive changes on the basis of an hour or so of interaction with the home visitors each week.

Instead of massive changes in the pattern of interaction between the mothers and their children on the basis of intervention by home visitors, what seemed to occur was a shaping by the home visitors of their interaction with the mothers. The home visitors seemed to show a method of working with the mother-child dyads where they structured their interaction with the mothers to follow from the already ongoing mother-baby interaction.

Although the above discussion seems reasonable, several concerns must be raised in relation to the data used in this study. First, these measures, both of the home visitor-mother and the mother-baby interaction, were observational in nature. From the simultaneous-cross redundancies and the lagged autoredundancies (Tables 14 and 15), it is apparent that they do not exhibit the type of relationship usually found between test scores. Their reliability is not exceptionnally high across time and their relationship at

any one point is not high. In both of these redundancies, the Mother-baby scores exhibit higher levels of influence. They seem to be both more predictive of Home visitor-mother scores at the same time and more reliable across time. At least part of this general priority on the part of the Mother-baby scores can be understood when we look at their breadth in comparison to the Home visitor-mother scores. The Mother-baby scores are five factor scores, incorporating a total of 34 items from three different scales. These items cover several different aspects of the environment, with some characterizing the interaction style of the mother, both verbal and nonverbal; the interaction between the mother and child; as well as the behavior shown by the child. The Home visitor-mother scores, however, are three single item scores, all from the same observational instrument. They cover but one aspect of the situation, the verbal interaction between the home visitor and mother. The word verbal is crucial in this discussion, for the instrument from which the three Home visitor-mother items were taken (RCS) dealt only with the spoken interaction between the two participants. It totally ignored any nonverbal behavior which occurred and because of this, missed many important parts of the home visitor-mother interaction.

These Home visitor-mother scores dealt with only a part of the total verbal interaction going on in the observed situation. Six different categories of verbal interaction were identified in project ISIS as occurring in this situation. The five types of interaction observed, besides home visitor-mother, were: (1) mother-

baby interaction; (2) home visitor-baby interaction; (3) home visitor-home visitor interaction, categorizing those instances where the home visitor continued to be the center of the verbal situation over several three second episodes; (4) mother-mother interaction, where the mother continued as the center of the situation; and (5) baby-baby interaction, where the baby continued to be the center of the situation. It should be remembered that in those interactions involving the baby the response on its part was not necessarily verbal. From an examination of the tables of means and standard deviations for males and females (Tables 6 and 7) for the first Home visitor-mother variable, "Total home visitor-mother interaction", it is apparent that all the interaction between the home visitor and mother hovered around ten percent of the total observed interaction at any one visit. Looking at the means across the seven visits, a general decrease is found in this variable for both sexes. In project ISIS another of the six types of interaction, mother-baby was found to occur at a frequency similar to that for home visitor-mother at the first visit, but to show an increase over the seven visits.

From the dissimilar changes over time shown in these two types of interaction, once again the Mother-baby scores seem predominant. Not only did they have greater breadth of coverage of the total possible situation, by including items from several different scales, but they also had a larger piece of the actually occurring situation to characterize. Although the three Home visitor-mother scores as a set were most likely accurate in their

characterization of the verbal interaction between the two participants, they reflected a much more restricted view of the total situation than did the Mother-baby scores. Because of this, they were more susceptible to changes across time and thus exhibit a lower reliability.

An analysis of the simultaneous-cross redundancies are perhaps crucial to understanding the actual relationships under consideration to this study. The redundancy measures provide evidence that there was higher prediction from Mother-baby scores to Home visitor-mother scores than vice versa. Perhaps this, in conjunction with the cross-lagged redundancies, point up the true importance of the mother-baby interaction in its prediction of home visitor-mother interaction. These considerations argue for restraint in the specific conclusions drawn from the results of this study. Although they must be conservative, some conclusions can be made.

First, it can be concluded that the interaction between the home visitor and mother was transactional in nature. While there was influence from home visitor-mother interaction to mother-baby interaction, what the mother and baby did in the intervention situation seemed more influential in its effect on home visitor-mother interaction. The data from this study show that when intervention is planned, it should not be assumed that the effects of this intervention are unidirectional, with the home visitor totally changing the amount of interaction shown between the mother and child. Instead, it might be speculated that what occurs is a changing, on the part of the home visitor, of her interaction with

the mother to more closely follow that already ongoing between the mother and her child. In this manner, perhaps the home visitor can effect the mother-child interaction by helping the mother shape this ongoing relationship so that it promotes positive development on the part of the child.

With the realization that the relationship between the home visitor and mother is transactional, the role of the home visitor can be clarified. While the role of the intervention agent has often been seen as being a teacher of the parent, the present study seems to suggest that this is an inaccurate characterization of the intervention process. The results of the present study seem to show that the mother was not learning a great deal directly from her interaction with the home visitor and using this knowledge to change her interaction with her child. Instead, what seems to be occurring was a continuing by the mother of her ongoing interaction with her child and this interaction in turn effecting how the home visitor interacted with her.

The present study, then, seems to indicate that the home visitor has limited effect, via the amount of her interaction with the mother, on the amount of mother-baby interaction. It does not, however, say much concerning what effects do result from the intervention by the home visitor into the home circumstance of the mother and child. While it can be hoped that the effects exerted by the home visitor are a type of subtle facilitation of the mother-infant interaction, the present data and results do not allow for the interpretation of this question.

When considering the results of the analyses performed for this hypothesis, a second conclusion that can be drawn is that the passage of time has no effect on the prediction of Mother-baby scores by Home visitor-mother scores. Examination of Figure 7 shows that the amount of variance predicted in the Mother-baby scores hovers between 10% and 20% over the six comparisons for both boys and girls. This produces a flat band of prediction, with neither an overall increase or decrease over time. In the case of the prediction from mother-baby interaction to the home visitor-mother interaction, however, time effects are evident for both sexes. The effect of time is a function of the sex of the infant. The differences due to sex in prediction of home visitor-mother interaction are highlighted in Figure 8, with trendlines drawn which summarize the predictive ability of the Mother-baby scores for both sexes. As is shown in the figure, the ability to predict Home visitor-mother scores generally increases for the males, while it generally decreases over time for the females.

A second type of sex effect is the peak shown in the predictive ability of the Mother-baby scores across the six predictions for the males. For the prediction from 25 to 31 weeks, the amount of variance accounted for by the Mother-baby scores is 53%. The amount of variance accounted for by Mother-baby scores peaks at the 31 to 37 weeks prediction. In this prediction, some 61% of the variance in the Home visitor-mother scores at 37 weeks is accounted for by the variance in the Mother-baby scores at 31 weeks. For the females, no such pronounced peak of prediction is found, with the amount of variance accounted for by the Mother-baby scores being similar for all comparisons.

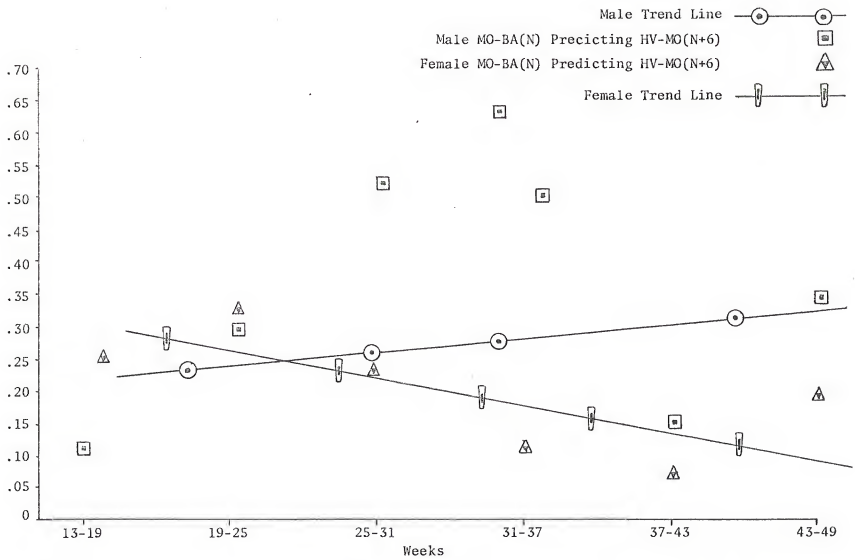


Figure 8. Trend Lines for Amount of Variance Predicted by Mother-Baby Scores at One Visit in Home Visitor-Mother Scores at the Next

An interesting parallel exists between the present results concerning these peaks in prediction for the males and the results of the earlier Social Roots project, which found the 25- and 31-weeks visits to exhibit exceptional correlations between the Competence factor scores and the Mother-baby factors. At the 31-weeks visit, the highest number of significant correlations were found between the two sets of factors. At both the 25-weeks and the 31-weeks visit, high correlations were found between the Mother-baby factor scores and several individual Competence factors for the males. At 25-weeks, a multiple r of .52 was found between Mother-baby factor scores and the Competence factor "Compliance". At 31-weeks, there were two multiple r's between the Mother-baby factor scores and Competence factors: a multiple r of .75 between the Mother-baby scores and the "Language" competence factor and of .72 between the Mother-baby scores and the "Compliance" Competence factor. Because of the several relationships found at these two time periods, this period (25-31 weeks) was seen as being important in the development of the male infant.

From these parallel results, it could be speculated that the mother has a special effect on both the male infant's development of competence and the home visitor's interaction with her during this six-week period. The reasons behind this seemingly "critical period" need to be examined to help identify the processes which are going on at that time.

In order for questions concerning the relationships that exist between the Home visitor-mother scores and the Mother-baby

scores and how these relationships are effected by the passage of time and the sex of the infant, valid and reliable measures of the interaction between the two dyads are required. Only with such measures can individual aspects of the different interactions be examined to see how they relate. In this way, conclusions could be reached as to what types of changes occur in the mother-baby interaction and what aspects of the home-visitor interaction relate to them. In the present study, dealing with both types of interaction variables as sets, it was impossible to examine such individual relationships.

Other questions may also be asked based on the results obtained in the examination of the relationships between the two sets of variables. For example, what effect does the predictability of home visitor-mother interaction scores have on the child's development of competence? Does a pattern of high predictability of the home visitor-mother interaction of the six predictions relate to a high level of development on the part of the child? Does it instead hinder the child's development, and a pattern of low predictability over the six predictions relate to higher competence? What relationships exist between the effects of time on the predictability of home visitor-mother interaction and the child's development of competence? Are there optimal patterns of prediction over the seven visits which can be identified as relating highly to competence? Since differences based on sex were found between the patterns of prediction from mother-baby interaction to home visitor-mother interaction, another question is whether these differences are a function of the home visitors' level of training?

The examination of the several issues above might take the form of profile analysis (Guertin and Bailey, 1970). This analysis would include examining an individual child's standing on the prediction of Home visitor-mother scores by Mother-baby scores on each of the seven taped visits. This examination of individual profiles would allow for their similarity to be assessed on several criteria. First, the individual profiles could be examined as to how similar they are in shape. In this manner, mother-infant dyads could be examined as to whether they show similar relationships between the predictive ability shown by the Mother-baby variables at several different times. From this examination, two profiles might be found to be similar in that the predictive ability shown by the set of Mother-baby variables at 19 weeks is twice that shown by the mother-baby set at 13 weeks. A second criterion is whether profiles show the same magnitude of predictability by Mother-baby scores. The two profiles mentioned above were found to be shaped similarly with the predictive ability shown by the Mother-baby scores at 19 weeks being twice what it was at 13 weeks. While these profiles are similar on the basis of shape, one may show redundancy value for the Mother-baby scores of .05 at 13 weeks and .10 at 19 weeks, while the second profile may show values of .30 and .60 respectively at the two times. While the shape of these two profiles is similar, their magnitude is not.

A third criterion is scatter, that is how much the several scores (in our case the seven Mother-baby to Home visitor-mother

redundancy scores) vary around the mean score over the seven visits. This criterion can be seen as a comparison of individual children's standard deviation of predictability.

Once individual profiles were compared on the above criteria, the resulting groupings of profiles could be correlated to the Competence scores for the children. This correlation would provide not only an estimation of the relationship between competence and the level of predictability from Mother-baby to Home visitor-mother scores, but also between the competence and the shape and variability of the prediction profile.

A second use of the obtained profiles would be their use in several discriminant function analyses. Through these analyses, the questions concerning the differences in profiles on the basis of sex and level of the home visitor's training could be examined.

There also is the question of why time interacted with sex to present different patterns of prediction for males and females. Why did the prediction of home visitor-mother interaction by mother-baby interaction increase over the six comparisons for the boys, while decreasing for the girls? Is it possible that the level of training of the home visitor influenced these patterns? In ISIS such a sex level of training interaction was found and it is possible that such an interaction was also operating in this study.

In the ISIS study, differences as a function of the interaction of sex of the infant with the home visitor's level of training were found in the percent of total interaction shown by the mother-infant dyads over the seven visits. Professional home

visitors were shown to be more successful in stimulating interaction between mothers and girl infants, as a group, while both paraprofessional and professional home visitors were equally successful in the stimulation of the interaction between mothers and male infants. Because the "percent of total interaction" measure used in this earlier study was only part of the total interaction measured by the RCS instrument and the three Home visitor-mother variables used in the present study are other parts of this total, there is a possibility for a similar sex level of training interaction to be present in these measures as well.

This question could be examined by the separate analysis of the prediction from Mother-baby scores to Home visitor-mother scores for each level of training. If home visitors were found to be differentially predictable in their interaction with mothers on the basis of their level of training, this would signal the need for consideration of this factor when considering the relationships between the interaction between home visitor and mother and the interaction of the mother and infant.

A fourth question concerns the prediction from home visitor-mother to mother-baby interaction. There were different results found on the different levels of analysis used in the examination of this prediction. Sex was found to be important in the prediction of individual Mother-baby variables by individual Home visitor-mother variables (Table 12), but to have little effect in the prediction of the set of Mother-baby variables from the set of Home visitor-mother variables. These differences may

at least be partially due to the following. First, it is possible that different variables were, on the individual basis, important for the two sexes, but they worked in opposite directions. Because of this, when considered on the composite level, these variables offset each other. For example, in the prediction of scores on the fifth Mother-baby factor, "Non-specific Social Transaction" at 19 weeks by the Home visitor-mother scores at 13 weeks, the terms reflecting the interaction of sex with each Home visitor-mother variable were found to make a significant contribution to the prediction equation. In this particular case, it might have been that the second Home visitor-mother variable, "Home visitor initiates-Mother responds" was a particularly good predictor for boys and not a good predictor for girls. The prediction value of the third Home visitor-mother variable, "Mother behaves-Home visitor warms, accepts, amplifies" might have been opposite, significantly improving the prediction of the same individual mother-baby variable for girls and not for the boys. When considered collectively, as was done in the index of redundancy measure used in the examination of the prediction of the set of Mother-baby variables, these differential relationships would tend to be offset by the variation in the predictive ability of the other Home visitor-mother variables used in the prediction of the set of Mother-baby variables.

A similar process would occur in relation to particular Mother-baby variables which were differentially predictable on the basis of sex, given the Home visitor-mother variables. In our example, the fifth Mother baby variable at 19 weeks was differentially

predictable for the two sexes. When this Mother-baby variable was considered along with the other variables in the set, this differential prediction would be lost by combining it with relationships of the other four Mother-baby variables which weren't differentially predictable on the basis of sex. A similar effect also takes place in the set of Home visitor-mother variables.

Because of the processes used in the combination of variables for the index of redundancy, then, differences on the basis of sex which would show up in the examination of relationships between individual variables are lost. This helps explain the divergence of results obtained on the two levels of analysis. In order to examine the effect of sex on the relationships between Home visitor-mother variables at one visit and the Mother-baby variables at the next, more work must be done to examine the question of the validity of the individual measures used. Only if these measures are valid on the individual level can we really get at the effects of sex on the relationship between the home visitor-mother and mother-baby interaction. If individual measures are found to be valid, a finer analysis will be possible, allowing much more attention to be given to the effects of sex.

Different findings, on the basis of sex, were found on a different level for the prediction of Home visitor-mother variables by Mother-baby variables. These differences were on the composite level, showing up in the indices of redundancy between the two sets of variables. When the redundancy measures were figured for the two sexes separately, differences in magnitude of redundancy were

found in several predictions (Figure 8). The general direction of change over time in the magnitude of these redundancies also were different, with the ability to predict Home visitor-mother scores from Mother-baby scores increasing over the six comparisons for the boys and decreasing for the girls. Sex, then seems to be an important factor in determining the predictive ability of the Mother-baby scores as a set.

This finding of differences on the composite level does not provide any information about how the predictive abilities of individual Mother-baby variables were effected by sex. This question was examined through the use of Mood's (1971) method of partitioning variance in multiple regression, but because of problems encountered in the Home visitor-mother scores (too little shared variance left in the individual Home visitor-mother scores after all other variables besides the ones in question were entered) no conclusions could be drawn.

It is possible, given the differences found between the two sexes on the composite level, that even if the question of the effects of sex on the individual variables included in the Home visitor-mother set has been open to examination, no significant differences would have been found. This possibility follows from the same logic used in the discussion of the effects of combining which served to offset the difference between individual Mother-baby variables in their prediction from Home visitor-mother variables. In the present case, it is entirely possible that while no significant differences existed in the predictability of individual Home visitor-

mother variables by Mother-baby variables, the differences which did exist between them added when they were considered as a set to a point where they showed obvious differences between the two sexes. A second possibility was that while two of the three Home visitor-mother variables were not differentially predictable on the basis of sex, the differences on the one variable which was differentially predictable on the basis of sex were large enough to offset the other two variables' lack of differences.

Similar processes could have occurred in the set of Mother-baby variables in respect to their predictive ability. They too could be effected only slightly by sex on the individual level, but have these effects add up when they were considered as a set. Or perhaps in this set, there also was one variable that was so effected by sex that it overshadowed the lack of differences shown by the other Mother-baby variables.

There is no argument here concerning preponderance of any one of the several alternatives presented. Their presentation is, rather, designed to show what possible relationships might have occurred. Because of these possibilities, once again the conclusions drawn must be restricted to the relationships between the two sets of variables and not individual members of each set.

A final question concerns aspects of the observed situation which might have been more informative as to the effect of the intervention process on the mother-baby interaction. It should be recalled that home visitor-mother was but one of six types of interaction identified as occurring in the situation. Since the

proportion of time spent in this one sort of interaction was well below 50% for any one visit, it is possible that other sorts of interaction would be found to effect the mother-infant dyad to a greater degree. For example, if the general theory of modeling holds for this type of learning (mothers learning techniques of interaction to use with their children), it would be expected that the part of the interaction labeled "home visitor-baby" would have great impact on the interaction between the mother and her child. It is possible that this indirect type of instruction was more important in changing the mother's interaction than was direct interaction between home visitor and mother as measured in this investigation. This question again requires more investigation aimed at expanding our understanding of the relationships which exist within the intervention situation.

Hypothesis 2

This hypothesis, in null form, was that no relationships would be found between home visitor-mother interaction at each taped visit and the Competence factors. This hypothesis was not rejected. There were no significant relationships found between the Home visitor-mother variables as a set and the Competence factors as a set.

The results of the analyses performed to test this hypothesis indicated that what the home visitor did with the mother in the intervention situation had no direct effect on how the child develops. This is not a surprising finding as the focus of the home visitor's attention was on the mother and her ability to

work with the child. Because of this focus, the little impact had by the home visitor was not directly on the child, but on how the mother and child interacted. The amount of home visitor-mother interaction accounted for only 10% to 20% of the variance in the Mother-baby interaction scores. Perhaps these amounts lead to subtle effects such as those shown in the relationship found to exist between mother behavior and child competence in the earlier Social Roots project. In this earlier study, Mother-baby observation factors, used in the present study in the examination of Hypothesis 1, were found to relate to the same factors of competence as those used in this study. These relationships were found to differ on the basis of sex.

A clue to the type of indirect effect of the home visitor on the mother-baby interaction could be taken from the results of the analysis for Hypothesis 1. These results show that although the home visitor-mother interaction had some effect on the mother-baby interaction, it was consistently overshadowed by the effect had by the mother-baby interaction on the home visitor-mother interaction. This finding leads to the conclusion that the home visitor did not drastically change the amount of interaction exhibited by the mother-infant dyad. The preponderance of prediction seemed to show the home visitor changing the amount of her interaction on the basis of the amount of mother-baby interaction.

APPENDICES

APPENDIX A

ISIS RECIPROCAL CATEGORIES SYSTEM

ISIS RCS

Description of Verbal Behavior

CDT		Mothers
1	"WARMS" (INFORMALIZES THE CLIMATE): Tends to open up and/or eliminate the tension of the situation; praises or encourages the action, behavior, comments, ideas, and/or conditions of another; jokes that release tension not at the expense of others; accepts and clarifies the feeling tone of another in a friendly manner (feelings may be positive or negative; predicting or recalling the feelings of another are included).	21
2	ACCEPTS: Accepts the action, behavior, comments, ideas, and/or contributions of another; positive reinforcement of these.	22
3	AMPLIFIES THE CONTRIBUTIONS OF ANOTHER: Asks for clarification of, builds on, and/or develops the action, behavior, comments, ideas, and/or contributions of another.	23
4	ELICITS: Asks a question or requests information about the content subject, or procedure being considered with the intent that another should answer (respond).	24
5	RESPONDS: Gives direct answer or response to questions or requests for information that are initiated by another; includes answers to one's own questions.	25
6	INITIATES: Presents facts, information, and/or opinion concerning the content, subject, or procedures being considered that are self-initiated expresses one's own ideas; lectures (includes rhetorical questions--not intended to be answered).	26
7	DIRECTS: Gives directions, instruciton, order, and/or assignments to which another is expected to comply.	27
8	CORRECTS: Tells another that his answer or behavior is inappropriate or incorrect.	28
9	"COOLS" (FORMALIZES) THE CLIMATE: Makes statements intended to modify the behavior of another from an	29

10 SILENCE: Pause, short periods of silence.

20 CONFUSION: Wetting "accidents" or unintentional interruptions. Periods of confusion in which communication cannot be understood by observer.

30 INFANT SLEEPING: Infant goes to sleep.

1 - 9 = Category numbers assigned to Home Visitor talk.
21 - 29 = Category numbers assigned to Mother talk.
11 - 19 = Category numbers assigned to Infant behaviors.

Adaptation of the Reciprocal Categories System For Use in Adult-Infant Teaching Situations

Baby

11 "WARMS": Baby smiles, laughs, gurgles, coos, etc.; including self-reinforcing behavior.

12 "ACCEPTS": Passive acceptance following adult initiation or direction; child does not ignore person or object but neither does he respond.

13 "AMPLIFIES": Simple imitation as well as amplification or extension of adult presentation without additional adult direction - 3 - 13 is a playful interaction. Infant plays with interest, concentration or attends closely to an object.

14 "ELICITS": Any response of the infant which tries to keep immediately previous activity going. Infant "asks for help" or assistance.

15 "RESPONDS": Infant responds appropriately (may be correct or incorrect) to an adult presentation.

16 "INITIATES": Infant engages in activity, in relation to people or objects, which has no observable antecedent. Both 13 and 15 require an observable antecedent. Exploratory behavior.

17 "DIRECTS": Any behavior of infant which attempts to get adult attention or direct adult activity.

18 "CORRECTS": Ignores.

19 "COOLS": Uncooperative; active aggression, crying, hitting, biting, etc., passive aggression; attempts to leave the field, crawling away, etc. 9 - 19: a tension situation, battle of wills.

20 "CONFUSION": Wetting, "accidents" or unintentional interruptions; periods of confusion in which communication cannot be understood by the observer.

30 "INFANT SLEEPING": Going to sleep.

APPENDIX B

WATTS HOME SCALE

ACTIVITIES

I. Highly intellectual activities

1. Verbalized and symbolic learning-

   Child is attempting acquisition of verbal sills, i.e. building of a receptive language, mastery of speech and such. (Child labeling objects, pictures, putting words together, etc.)

2. Perceptual, spatial and fine motor learning-

   Child tries to: 1. Differentiation in visual perception and spatial orientation. 2. Acquire skills for perceptual and fine motor coordination. (Such things as fitting, stacking blocks, putting buttons in can, etc.)

3. Concrete reasoning-

   a. Visual pursuit—Tracking of an object by a child through his visual field (early task—following rattle by mother)

   b. Object permanence—The child is to achieve an understanding that even though an object is out of sight it does not cease to exist. (For example: a toy is put under a blanket to see if the child will still attempt to find it.)

c. Differentiation of means and ends—The child is to become aware that sometimes things (means) can be used to get desired objects (ends). (For example: A toy is put on the far end of a blanket and the child is to see that by pulling the blanket, the toy* can be obtained.) (Means* ; Ends*)

d. Scientific laws—The child is to become familiar with some basic scientific laws through usage. (For example: The use of the mirror to show the child the use of the scientific law of reflection.)

e. Categorization and classification—The child is to become aware of objects falling into categories and classifications according to characteristics of the objects (function, physical appearance, etc.) (Example: Showing the child two "hard" objects and then showing him two "soft" objects so that he can compare the properties of each.)

f. Dissonance—The child is to be able to recognize that things don't appear as they should and be able to take steps to attempt to correct it. (Example: Trying to fit a block

through a slit in the plastic top of a can and, finding that it won't, taking the plastic top off and trying to fit the block in again).

g. Dual focus—The child is to achieve an ability to do one activity while observing other aspects of his environment. (Example: The child tries to find an object that is hidden (object permanence) while looking at the two adults talking to one another).

4. Imaginative

Child's expression of imagination and fantasy or the creation of representational products. Role play, assigning roles to symbolic toys, etc. (For example: with an older child playing with a long low box and pretending that it is a truck.)

5. Executive Skills

Sequential task that is one which involves several steps from beginning to end. Steps may either be in fine motor areas or in concrete reasoning but the Important aspect of the activity is the Sequencing of Execution. (For example: Playing patty cake or other such games.)

It will be subsumed under concrete reasoning tasks when the child's ability for concrete reasoning is the main goal of the task. (Putting smaller cans into

large can, hopefully in a step-wise fashion, which would be more of a fine motor type of activity).

II. Moderately intellectual activities

6. Exploration of household items

Investigation of places and objects in the "Household" (in our situations, "Household" means items in the video studio which aren't usually used in the presentation of tasks). (A good example of this would be playing with the mike, another is playing with the mat where he is placed for the mat isn't normally used in task presentation.)

7. Exploration of toys

Use and examination of "Playthings" means things used in task presentation, but not being used at this very moment. (An example is when the child plays with the rattle after it has been used, but not being used at that moment.)

8. Exploration of nature

Child explores living things, plants and animals. (Not often seen, but if the mother or PE shows a leaf or such to the child, this would be scored, unless an obvious intellectual goal was being sought.)

9. General or routine information

Child gains information (general) about his daily routine and the wider world around him. (An example of this would be "This is your bottle. You'll soon have a full tummy and feel much better.")

III. Nonintellectual activities

10. Basic care

The child's biological needs are being met and/or child is learning to adjust to social norms in meeting those needs. (Example: Mother blows child's nose, changes his diapers, feeds him a bottle, etc.)

11. Large motor learning

Child's trying for acquisition of skills for large motor coordination or the use of equipment which promotes coordination of the large muscles. (Holding the child up, trying to get him to stand or walk.)

12. Unspecific

Child is just passing time by another means than those listed here. Behavior must be uncodeable in any of the other categories.

IV. Social-emotional activities

31. Emotional and social expression—<u>Positive</u>

Child is mainly expressing positive emotional feelings: affection, joy, pleasure, etc. Shown through facial expressions, gestures or actions, verbally (that is cooing or such) or other activities.

This is to be scored when the basic thrust of the activity is to make the child feel good, laugh or such.

32. Emotional and social—Negative

Child is mainly expressing negative emotional feelings: hostility, temper tantrums, anger, fear, jealousy, etc. Also may be shown by facial expressions, gestures or actions or by verbal means, that is crying, yelling, etc.

33. Emotional and social expression—Neutral

Child is expressing emotional need for secuirty, social contact or attention, or compliance with certain culturally prescribed social behaviors such as gestures or modes of speech.

DEFINITION OF AN ACTIVITY:

An activity is the observable experience of the child. In this definition, "Experience" includes:

a. The child's actual behavior (alone or in interaction with another person)

b. Interaction with another person with the child inactive

c. Suggestion or preparation for a future activity

d. Child's attentive observation of objects or another person's behavior.

IDENTIFICATION OF AN ACTIVITY:

Identification of an activity is based on consideration of several observable components:

a. The quality of the child's behavior

b. Charecteristics of material objects involved

c. Behavior of another person who interacts with or is observed by the child.

Techniques

1. Most frequently occurring

   21. Didactic teaching-

      a. Labeling, reading

      b. Demonstration, explanation and expansion—
         Showing the child what to do. ("Put it here."; "Turn it over."; "Do it this way.")

      c. Assessing what the child knows-
         Asking for answers from the child—verbally or behaviorally. ("What's that?" "No, that's not the way to do it.")

      d. Providing feedback-
         Telling the child whether actions are correct or incorrect. ("Yes, you're right." "No, that's not quite right.")

      e. Imparting a) Specific knowledge or b) Relating experience for concept formation-
         Highly cognitive information, not a usual occurrence for children three months to a year, but the adult might indeed say something that you might fit into this category. "You remember you hurt yourself when you touched the stove last time." (A) "You hurt yourself because the stove was hot and burned your fingers. (B) "Be careful."

40. Active participation

a. Actively engaging in a given activity with child. (Playful interaction, a good example. Battle on elastic a specific activity which is the focus of the play.

b. Dramatizing with the child watching. (A more playful interaction than 21b, demonstrating. "I'm gonna get you. Boo!")

c. Roughhousing, talking, playful teasing. A more active sort of play than 40b, mother throws child up in the air and catches, etc., fairly rough.

22. General information/comments

a. Social chit-chat—Not task-oriented, light conversation such things as "How pretty," "Aren't you a pretty little boy/girl.")

b. Informing—Close to a teaching technique. The adult answers the child's question (either verbal or gestural) (e-"UHHHH" m-"Those are blocks, red blocks with white letters on them.")

c. Questioning/repeating—Rephrases child's question in more grammatically correct English. (c-"UHHHH?" m-"Oh, you want to do this?")

II. Control categories

23. Suggestion/direction

a. Suggestion—Mother suggests that the child do something and do it in a certain way. ("Why not try to turn it over?")

b. Direction—Mother directs child in procedures to be followed and/or how they are carried out. ("Get over here and find that toy!" "Let go of it!")

24. Restriction

a. Cautions—Adult provides child with reminders concerning safety considerations ("Be careful, it might fall on you.")

b. Denials—Adult prohibits child from doing something. ("No! You can't have those marbles." "That microphone isn't to be touched.")

c. Postpones—Adult tells the child he will be allowed to do something, but he must wait a time first. ("You can have your bottle when you are through." "You can't have the truck until you have found the doll.)

34. Distraction

The adult tries to divert the child's attention from that which he is doing to those things that are more task-oriented as decided by the adult.

May be verbal ("Look here, see the baby.") or behavioral (Mother puts keys in front of baby's face after he seems to be staring out into space. Tries to get the child to follow the rattle.)

32. Negative reinforcement (Negative Tone)

    a. Removing the child from the situation—The adult simply removes the child from the area where he/she is getting into trouble. (Not an attempt to involve him with a task as is the case in 34-Distraction.)

    b. Removing an object from the child—The adult removes toy or something from the baby in order to get him to stop an activity. (Again no attempt to involve him in another activity.)

    c. Punishes via hitting, spanking, etc.—The adult tries to get the child to stop an activity by physically negative means. (Child playing with microphone, mother slaps his hand.)

    d. Scolds, shows disapproval, threatens—Adult tries to get child to stop activity by verbally or gesturally negative means. (Child plays with microphone, mother says "AHHHH." or "Don't do that!" or "I'm gonna smack you if you don't quit it!")

INITIATION

1. Indicates whether child himself or another person has initiated the activity.

2. Indicates whether the activity coded for 15-second coding unit is part of a continuous behavior or whether the experience described in the coding unit is qualitatively different from that of the immediately preceding unit.

0- Continuous activity

1- Activity initiated by mother

2- Activity initiated by Subject child

3- Acitivity initiated by the other adult

4- Activity initiated by other child.

ENCOURAGEMENT INDEX

This dimension only applies when an interaction is taking place between subject child and another person. It indicates the other person's attitude concerning the child's behavior and usually parallels the interaction technique(s) used.

1- Other person ENCOURAGES child's behavior

2- Other person DISCOURAGES child's behavior

0- Other person's attitude toward child's behavior NEUTRAL

COMPLIANCE INDEX

This has to do with the child's reaction to a directive or restrictive * technique.

1- S COMPLIES

2- S DOES NOT COMPLY

0- Not RELEVANT, not KNOWN.

*NOTE IN TECHNIQUE SECTION: The Control categories are the ones where this dimension fits in best. Do not code this dimension (i.e. code a 0) if other than a Control technique is observed.

Child Behavior

1. Constructs product

   The construction of some sort of product by the child. Not too unusual in this age child (Examples: Building a sandcastle; or building a fort out of blocks.)

2. Mastery

   This is coded when the child is actively involved in successfully completing a particular task or doing some activity in the correct way. (An example: The child diligently tries to get a button into the can.)

3. Following sequential steps

   Goes along with games and such where a sequence of behaviors is necessary for the successful completion of a task. (Goes with 5, activities code, Executive skills.) (An example would be mother and child playing pop-goes-the-weasel.)

4. Exploration

   This is coded when the child drifts from specifically task oriented mastery behavior into exploring of objects or the environment on his own, not in a task oriented way. (An example: The child quits trying to get buttons into the can and instead puts them in his mouth, shakes them, etc.)

5. Observing

The child watches people or objects in his surroundings, but makes no overt behavioral mode to follow, respond, etc. (Example: The child sits and watches as the mother shows him the rattle, but makes no overt move to get it.)

It is also coded when the child is active, but in an undifferentiated way, that is so that none of the other child behaviors can be coded.

6. Blank Stare

This is different from Child Behavior #5 in that the child does not seem to be watching either an object or an individual in his surroundings, but instead seems more interested in his internal happenings. (No emotional concomittants)

21. Use another person as a resource

Child enlists help of another person for materials or aid. The child is focused on what he is doing rather than the particular person from whom help is sought.

22. Asserts self

To put forth suggestions or procure permission, serve as a model or leader, to dominate. The child takes the initiative and starts the activity or playful interaction.

23. Seeks or maintains attention

Child moves toward, stands near, touches, shows something to or misbehaves to get or maintain a person's attention

Child initiates and keeps the attention going. (Example: Mother and PE are talking, child crawls up into mother's lap in an effort to gain attention.)

31. Expresses affection

This is associated with activity #31—Child's part of the activity. It is possible, however, that this child behavior will occur with other activities.

32. Expresses distress

Child expresses displeasure, anger, hostility, aggression or hostility or rejection to another child's main purpose to express negative feelings which are directed to another person or are independent of the other person. This is also associated with activity #32.

33. Seek emotional comfort

Use of "security" objects, thumb, blanket, etc. to express dependency. Associated with activity #33.

APPENDIX C

ESCALONA SCALE

20) SOCIAL INPUT

DEFINITIONS:

20.1-20.16 NONSPECIFIC SOCIAL CONTACT

This category refers to all instances when the child shows a clear awareness of the fact that another person approached or intervened in his experience in some fashion, but the content does not fall into any one of the more specific modalities as defined. This category includes instances of the other person having no goal and/or purpose to this contact, just simple interaction for its own sake, and such is included. The child shows his awareness of social contact by all behavior activations and behavior alterations oriented toward the social partner. Included are such things as gazing. Small infants are scored for this when their awareness is accompanied by smiling or other Social response.

20.17-20.32 FIRST STEP FOR PATTERNED RECIPROCAL ACTIVITY IS PROVIDED

This is assigned to all instances when it is someone other than the child himself who initiates such reciprocal activity.

Among young babies (our age group), the only way behavior indicates that the child understood the other person's invitation is by him performing his share of activity.

If no indication is given by the child as to understanding the other's purposes, no scoring is done or UNSPECIFIC (above) scored.

20.33-20.48 BEING OFFERED TOYS OR GIVEN TOYS OR OTHER THINGS

All instances in which the child has the experience that someone else gives him or offers him an object. Whenever the child is given anything, which is not part of a Patterned Reciprocal Activity or the following by the mother of an expressed wish on the part of the child.

The child must observably be aware of two aspects of the situation: 1) That an object has become accessible and 2) that it was given or offered by someone else. Number 2 will be taken to be present when visual regard of the social partner and/or directed smiling (responsive acknowledgement) is present.

It is necessary, therefore, that the person offering or giving the object must be centrally located in the child's visual field and/or close enough to the child so that the latter can hardly avoid awareness of the other person by a combination of visual, tactile, auditory and vibratory cues (or one of these in isolation).

It must be obvious that the child realizes that <u>someone</u> is offering or providing toys and such.

20.65-20.80 BEING COMPELLED OR BEING DIRECTED

Score all occasions when the child has the experience that another person compels or directs his behavior in a direction or in a manner that does not correspond to <u>self-generated</u> action impulses manifest at the time. Being compelled or directed differs from being restrained or being coerced by the circumstances that the action of the other person does not run counter to the child's

manifest inclinations. It merely brings about a behavior change in what "had not occurred" to the child, in the sense that he had not initiated it, nor shown an opposing behavior tendency. Not the same as experiencing a request of another person for the other person is attempting to directly alter the child's behavior and not, as in requesting, working of the motivational states of the child.

Examples include when someone takes the child's hands and performs the clapping motion of pat-a-cake for him. With older babies, being compelled or directed may take a verbal course, such as "sit up straight" and spoken in such a tone so immediate that it leaves the child no choice.

It is required that the child's behavior indicate awareness that the compulsion or direction emanate from the other person. In many instances the presence of another person in the perceptual field in the child's immediate perceptual field is sufficient indication.

20.81-20.96 BEING RESTRAINED MILDLY

This category includes all instances in which the child has begun an activity which is hindered or interfered with by another person are defined as restraint, provided the child recognizes that the restraint was imposed by the social partner. Physical restraint is the most common but verbal prohibition while the child is already engaged in the activity equally constitutes restraint.

If a child is thumbsucking, or mouthing his hand or an object in his hand, and someone removes the hand from the mouth, this episode is scored as restraint if the child's immediate response is to bring the hand back to the mouth, even in the absence of negative affect. (If the child did not return his hand to his mouth, this episode would be scored as "coercion," even if later he stuck his hand back in his mouth.) The important defining element is that another person does something to arrest or prevent the execution of an action that had already begun. Restraint is not scored if the restraint is not effective in its impact on the child's behavior. It is scored, however, even if the prohibition's effect is transitory on the child's behavior.

Only restraint characterized as mild is scorable here. The intensity of restraint is judged exclusively by the impact upon the child's behavior. Thus, if the child merely stops the action he is engaged in, but soon after calmly proceeds to execute it, and/or if his response is limited to either no affect of mild and transient displeasure, the restraint was experienced as "mild" no matter how forcefully the other person may have grasped his body or voiced their prohibition.

20.97-20.112 BEING RESTRAINED SEVERELY

The general definition is the same as above, but with more intense affect on the part of the child. Thus the child's response to restraint is <u>massive</u> and <u>affect-laden</u>.

20.113-20.128 BEING COERCED MILDLY

When the child is made to do something by another person, while the child manifests resistance against behaving in a manner

enforced by the social partner. In order for such episodes to be scored, the other person must succeed at least temporarily in making the child do something which he clearly indicates he does not wish to do. (Restraint=being forced not to do something; coercion=being forced to do something against the child's will.)

Coerced mildly refers to the instances in which the impact of coercion is of moderate degree. Thus if physical resistance on the part of the child is neither very energetic nor prolonged, MILDLY would be scored.

20.129-20.144 BEING COERCED SEVERELY

This is similar to above, but struggle between the child and the other person becomes intense. This intensity is manifested by the amount of force the child expends in resisting and by the intensity and duration of negative affect shown. Thus once again the severity of the child's response make the difference between mild and severe.

20.145-20.164 BEING FACILITATED

Whenever an activity started by child himself is made more possible or easier to perform, due to intervention on the part of the other person. Again, the child must indicate by his behavior that he is aware of the fact that the other person is helping him. Such awareness is registered either by visual and/or vocal orientation to the other person, or if the other person is prominently in the child's visual field.

Most important is that the child himself complete the action rather than having the other person do it for him.

Facilitation in many instances will consist of some alteration in the environment performed by the other person. Usually by behavior, only in rare instances will verbal alteration be scoreable.

Example includes, a toy is beyond a child's reach and the mother pushes it just to within the child's reach, this is facilitation. (If mother gives it to him, she would be "Giving something" to the child.)

20.165-20.180 RECEIVING DEMONSTRATIONS OF AFFECTION OR PRAISE AND ADMIRATION

Whenever the child shows awareness that affectionate approving attitudes and feelings have been shown him by another person, are included here. The objective nature or intent of the other person's approach is not sufficient nor is the child's awareness of the fact that another person is in contact with him at the time. We assume the child feels himself to be the object of expressed affection and approval when he shows positive pleasure in direct response to it.

It is assumed that infants up to the age of 5 or 6 months do not discriminate between pleasurable social-stimulation from another person and more specific case of receiving signs of affection and approval. In older toddlers, repetition of the act that has been praised may take the place of direct affect. The score will be applied only if the child's responsiveness has the specific social quality as described above.

Excluded are types of instances such as when the child is in a state of distress and demonstrations of affection by another person seems to comfort him.

20.181-20.196 BEING SHOWN SOMETHING OR HAVING ATTENTION CALLED TO SOMETHING OR RECEIVING INFORMATION

This is scored whenever another person succeeds in orienting the child to an aspect of the perceptual field to which he was not previously attentive or in conveying information to the child by gesture or word when the information is not in response to a question on the child's part.

In order to receive a score, the child's behavior must unequivocably indicate that the other person has in fact lead him to attend to something in the environment to which he was not previously or spontaneously attentive. It is also necessary that the child register behavioral awareness of where the information came from.

If such a redirection of attention takes place due to auditory means on the part of the adult, the adult must be conspicuously in the perceptual field of the child.

The present score is reserved for situations in which the social partner does not conspicuously alter the perceptual field, but directs the child's attention to something he had failed to notice.

20.197-20.212 BEING ASKED A QUESTION OR RECEIVING A REQUEST

This is scored whenever the verbal request is made of the child and his responseive behavior clearly indicates that he has understood the content of the message. Early examples are being asked to name something, perform a trick or such, etc.

Criteria for this being scored is the child attempting to answer the question or supply what is needed or wanted.

In order for the score to be appropriate, the question or requests must be of the type that requires a response.

20.213-20.228 RECEIVING ANSWERS TO QUESTION OR COMPLIANCE WITH EXPRESSED REQUESTS OF FULFILLMENT OF WISHES

Under this topic are all instances in which the child has expressed a wish or desire or had requested information and someone in the environment makes a positive response, thus the partner answers a question, complies with the child's expressed desire or grants a wish. Expressions of wish can be shown by the straining of a body or the communication in behavioral terms by the child that he wants something about to happen <u>not</u> to. (Refusing to eat a spoonful of food, and the mother withdraws it.)

Again the child must be aware of the other person's role in his receiving the answer, fulfillment or compliance.

20.229-20.244 NOT RECEIVING COMPLIANCE WITH AN EXPRESSED DESIRE, OR NOT RECEIVING REQUESTED INFORMATION OR BEING REFUSED A WISH

This is just the opposite of that described in the preceding category. It applies whenever the child expressed a wish, etc. and the person to whom the request was directed either failed to comply or expressed negation. This noncompliance and such may be due to simple imitation, etc., but we are not interested about the reason for it, just scoring for noncompliance. (Even when the child wants the impossible to happen.)

The criteria for determing whether a wish or such was expressed is the same as in the preceding category; in this category, another expression of a wish or desire after the adult's failure to comply will constitute sufficient evidence.

20.245-20.260 BEING HURT OR BEING PUNISHED OR BEING SCOLDED OR BEING ATTACKED

This category scored when the child expresses hurt, displeasure, embarrassment and such and attributes them to the action of another person.

In cases of scolding, punishing, or threatening behavior on the part of someone else, the expression of negative affect directed at the social partner. In the case of being hurt or attacked, either marked displeasure while continuing to be aware either of the social partner or counter aggression are most likely to occur. Episodes should be included even if the social partner did not mean to hurt the child, but the child perceives it as purposeful and his (the child's) behavior is the same as if it were.

Some sort of overt, observable response (withdrawal, affect display, counterattack, etc.) must be present.

20.261-20.276 BEING SOOTHED OR COMFORTED OR REASSURED

This variety of social input is limited to situations in which the child registered distress and a degree of arousal and excitation along with discomfort. Whenever the actions of the social partner serve to both decrease (or eliminate) distress and lead to distinct reduction in the level of excitement criteria for inclusion here has been met.

Examples include a clear reduction in the amount of movement, clear relaxation from stiff postures or tense motions to more relaxed postures and low-level activity or quiescence.

Inputs on the part of the other person defined as soothing and comforting are things like cuddling, patting, rocking and singing and giving to the child a pacifier. On the last example, this category will be scored if it is obvious that the child needed soothing and was aware of the other person, and was soothed, if it is not obvious, then this category would not be scored.

20.277-20.292 BEING CHEERED AND DIVERTED

This score is applicable only when the child is in a state of distress, discomfort and therefore at least some degree of behavior arousal as defined in the preceding category. Whenever the activities of a social partner succeed in eliminating overt displeasure so that the child either attains the affective condition we have defined as neutral or begins to show a positive affect, but there is no significant decrease in excitation. Thus this is a change in mood or affect level. It is necessary that the child be aware of the other person while experiencing improvement in his feeling state.

The tactics used by the adult may be similar to "being offered or given things" but a change in mood and affect state is the determinating factor. That is the child starts in low affect state, but improves as a result of the diversion given by the adult.

21) SOCIAL INTERACTIONS

DEFINITIONS (GENERAL):

Social interactions are reciprocal contact between child and another person in which the behavior of each partner is transmissive as well as receptive. It also may consist of

Example: Transmission of a message (Step A)

Responsive return of a message (Step B)

simultaneous reciprocal responseiveness of such duration and intensity that the episode is regarded as a significant event of a particular kind in the child's life. Not all varieties of social interactions that meet the above criteria will be scored. Rather the most common and most important patterns of social interaction have been selected for inclusion.

Consider an interaction as here defined has taken place only if the sending of a message has been followed by a separate communication in which the recipient of a message either acknowledges what has been said to him or makes a relevant reply. As defined in detail below, a communicatory exchange between child and social partner will be scored under social input or social output if the sequence is limited to A-B (partner to child - vice versa) it <u>is</u> scored under social interaction if a communicatory response is made by the recipient (A-B-A).

Definitions:

21.1 MUTUAL GAZING, BRIEF

Mutual gazing refers to <u>sustained</u> mutual eye-focus between the child and another person. (Excludes casual meeting of glances.)

In infants below five months, eye contact as short as 1 second meets this criterion, provided that mutual gazing is the primary activity on the child's part. Among older infants, it is required that the child and other person hold each other's gaze for more than a second, again the intensity, (indicated by the fact that all other activity, if any, is incidental and the child's attention is absorbed by the gazing) is more important than the duration.

Some body movement is alright if the infant's gaze is riveted to other's eyes. Remember that child's participation is all important, his behavior determines whether this is scored. Mutual gazing is therefore determined by the child's actions and not what the intent of the other person might be.

Mutual gazing brief is mutual gazing episodes lasting three seconds or less.

21.2 MUTUAL GAZING, PROLONGED

Same general definition applies as above. The only difference is in the duration of the episode.

Mutual gazing, prolonged is an episode that is longer than three seconds.

21.3 MUTUAL GAZING WITH SMILING AND/OR VOCALIZING, BRIEF

Mutual gazing with an added component of smiling and/or vocalizing.

Brief again is determined by the duration of the episode being equal to or less than three seconds.

21.4 MUTUAL GAZING WITH SMILING AND/OR VOCALIZING, PROLONGED

Same as above, that is mutual gazing with a component of smiling and/or vocalizing added on.

Duration of episodes under this definition should be more than three seconds.

21.5 RECIPROCAL VOCALIZING, BRIEF

This category includes all instances of vocalizing between the child and his social partner (A-B-A-B). These vocalizations may either be of a verbal nature or simply sounds being traded from one to the other.

Duration determines whether a particular episode is brief or not. The episodes included under brief have a duration of three seconds or less.

21.6 RECIPROCAL VOCALIZING, PROLONGED

Same definition as above, only with a duration of more than three seconds.

21.7 COMMUNICATION BY GESTURE OR IDIOSYNCRATIC WORDS:

This is the lowest level of the communication scale. In this category a message must be conveyed from one partner to the other and a responsive message must have been returned from the recipient of the first message. This is scored only if a gesture has come to assume a specific meaning which does not vary. So too sound patterns, that is idiosyncratic words must be consistently associated with a particular meaning ("Call sounds").

Score is given due to child's behavior. Idiosyncratic words or gestures can be used but no message is communicated - no score would be assigned here.

Difference between this and above category is the lack of reciprocity in the communication. In this category the child is the only one who is communicating.

21.8 PATTERNED RECIPROCAL ACTIVITY

This includes interactions between child and other that follows a pre-established pattern that requires each partner to perform a particular action. Sequences of actions contributed by both. All games with rules are included under this category. If the mother plays peek-a-boo and the child merely smiles at the reunion, a score is not appropriate. If child hides his face and/or turns his head or torso as if he is looking for his mother (who is hidden), the game meets the criterion for this score. Child's behavior must be ascertained to be organized to conform to a pattern that has already become established and familiar. Must continue long enough for each partner to have done what is required of him at least twice. (A-B-A-B). This is not simultaneous activity.

This category applies to each separate episode of reciprocal activity (as defined under scorings of category #20) and can go beyond A-B-A-B but each unbroken episode of such play is recorded as a single score.

25) SOCIAL OUTPUT

25.1-25.16 NONSPECIFIC SOCIAL CONTACT

Applies to all instances while the child directs behavior to another person in a manner which does not meet the more specific criteria for any of the other modalities. This may be true either because the social contact has no particular purpose or direction, or may be true due to the fact that the child's behavior does not reflect the quality or direction with sufficient clarity to meet criteria for inclusion in any of the other modalities.

The child's behavior must constitute a clear-cut episode, with a beginning and an end. Also casual regard and transient smiles or frowns do not constitute input.

25.17-25.32 TAKES FIRST STEP IN PATTERNED RECIPROCAL ACTIVITY

This category parallels the similar one in the Input categories. This score applies only when it is the child himself who initiates or attempts to initiate a patterned reciprocal activity. The child's behavior must make it clear that he expects the partner to respond in a particular way. As long as the child's behavior is unequivocal, it is not required that the social partner respond.

If there is any doubt about the child taking the first step, do not assign this score.

25.33-25.48 OFFERS OR GIVES THINGS TO ANOTHER PERSON

Applies to episodes when the child gives another person an object or extends an object toward a person in an unequivocal gesture of offering it, whenever this action is not part and parcel of another more specific modality.

It will be scored if the child extends the object to another person, puts it in their hand, or deposits it on the other person's lap. Not required that the other person accept the offering, as long as the quality of the child's behavior is unequivocal. When in doubt as to whether the child gave a person something as part of a request, assign the present category (less specific).

25.49-25.64 COMPELLS OR DIRECTS ANOTHER PERSON

Applies to behavior episodes during which the child attempts to alter or manipulate the behavior of another person, when what the child wishes the other person to do does not meet with resistance nor run counter to an activity already initiated by the other person.

This is a behavioral sort of direction, any verbal direction, "Do so and so" is different from compelling or directing by the fact that in this category the child seeks to actively implement the behavior which he tries to get the other person to do. It also differs from protesting and resisting by the fact that the other person is not engaged in behavior contrary to that which the child seeks to impose.

25.65-25.80 CALLS ATTENTION TO SOMETHING OR PROVIDES A SPECTACLE OR CONVEYS INFORMATION

When the child directs the attention of the social partner to something in the environment, as well as to episodes where the child communicates information. All this behavior has in common that the child takes the initiative in directing the social partner's attention toward something in such a way that it is the

child who introduces a refocusing of attention or something new into the awareness of the other person.

Examples are things such as pointing toward something, doing tricks obviously to try to gain the partner's attention.

25.97-25.112 ANSWERS QUESTION OR COMPLIES WITH REQUESTS OR GRANTS WISH

Refers to behavior episodes during which a child has been asked a question, or a request has been directed at him, he understood the message and his responsive behavior is in the direction of positive compliance. The score implies the presence of communication.

Examples are the child going to the person who called him or letting go of something when asked to.

25.113-25.128 EXPRESSES WISH OR MAKES DEMAND

Refers to behaviors which are specifically directed to another person and communicates a demand, a request or a wish. In younger children (our age group) the child need not look directly at the other person, instead this score is applicable if the other person is prominantly in the child's perceptual field. Thus, an infant stretching his arms toward a desired object and uttering a call sound, need not look at the other person, but look at the desired object, provided the other person is perceptible to him at the time. At this age, it is important that the particular gesture or sound must unequivocably denote "I want" as indicated by the fact that the same gesture or sound has previously been observed when the child expressed a which, the mother's assurance is not enough.

25.129-25.144 NEGATES WISH OR INDICATES NONCOMPLIANCE WITH REQUEST

Refers to instances where a request or wish has been expressed toward the child, he has understood the message and indicates by word or gesture that he does not intend to comply. A failure to comply or active resistance and avoidance are not sufficient, a conventional mode of expressing negation must be present. (Mother says "Give it here" - child shakes head "No" or moves object out of mother's reach.) This differs from protesting or resisting by the fact that the other person is engaged in behavior contrary to that which the child seeks to impose.

25.145-25.160 EVADES OR AVOIDS OR WITHDRAWS

Whenever the child responds to manipulation, an offer or any other form of stimulation delivered by another human being, by efforts to remove himself from the unwelcome contact, this score is applicable. This may occur in response to requests or invitations or in response to compulsion or coercion.

Negative affect display may be associated with this but not necessarily, as when it occurs in a teasing fashion, accompanied by laughter.

There is not <u>active resistance</u> to the unwelcomed contact in evasion or avoidance as is present in resisting or protesting. If both should happen at the same time, the rule is to score the resistance or protest aspect and ignore the avoidance.

25.161-25.176 PROTESTS OR RESISTS

Applicable whenever the infant or child responds to social input by:

1. Protesting, that is distinctly angry squealing and crying or counter-aggression, in the form of inflicting hurt or angry verbalizations denoting hostile feelings toward the social partner.
2. Resisting, that is bodily and verbal behavior that runs counter to whatever the other person is doing or demanding.

All behavior of direct protest and resistance focused upon another person are to be scored, even if it is not entirely clear what the child is protesting about.

The child need not communicate an intention of noncompliance, though he may do so, in order to receive this score. If noncompliance and resisting occur together, ignore the noncompliance and score resisting, protesting.

25.177-25.192 INFLICTS HURT, SPONTANEOUSLY

Behavior episodes during which the child intentionally hurts another person, or at least directs distinctly negative affect toward the person he is hurting, provided that such behavior is not a response to an immediately preceding or concurrent social input.

Instances where the child is objectively causing pain, but in a totally playful manner are not scorable here, the negative affect is essential for this category to be triggered.

25.193-25.208 SHOWS AFFECTION OR GIVES PRAISE AND ADMIRATION

This score is applicable when children (usually older than our kids) direct conventional and clearly expressive signs of

affection and/or other positive feeling toward another person. It is necessary that displays of affection occur in the conventional forms (hugging, kissing).

Kissing gestures that are taught a baby in a reciprocal-game fashion are not to be scored here, nor is a score appropriate when hugging is no more than a close approach (in which case it is then scored as nonspecific).

APPENDIX D

COMPETENCE MEASURES

ISIS SOCIAL ABILITIES SCALE

1. ATTENTION OF ADULT-POSITIVE

   (a) MOVES TOWARD AND STANDS OR SITS NEAR ADULT-

   Child places himself in the vicinity of an adult and waits or expects to be noticed by the adult.

   (b) TOUCHES ADULT

   Touches or pulls at adult to make the adult aware of the child's presence.

   (c) BEGINS INTERACTION WITH ADULT

   Child shows something to the adult to begin an interaction or to be noticed (not portions of the environment made by the child—that to be scored in pride in product).

2. ATTENTION OF ADULT-NEGATIVE

   Showing off or misbehaving to draw attention to himself. Probably not very prevalent at this age level.

3. USES ADULT AS RESOURCES

   (a) SEEKING HELP WITH CLOTHING

   Child seems to be asking for help with clothes—zippers coats, etc.

   (b) SEEKING HELP WITH EQUIPMENT

   Child asks adult how to use something, to obtain something, etc.

4. USES ADULT AS A RESOURCE - EMOTIONAL

Seeks comfort or reassurance.
Shows dependency, asks for adult aid, support or affection after a hurt or scare or such.

5. COMPLIANCE WITH ADULT'S DIRECTIVES

WHEN THE CHILD FOLLOWS ADULT'S DIRECTIVES

The adult directing the child is necessary for compliance to be scored.

6. NONCOMPLIANCE WITH ADULT'S DIRECTIVES

(a) RESISTANT - VERBAL

Child says he does not want to do something or shows it through whining that he doesn't want to comply.

(b) RESISTANT - PHYSICAL

This can occur alone or with (a).

(c) DISOBEYS OR IGNORES -

Child actively disobeys the adult's directives by doing something else. Implied disobedience when child ignores the adult directions.

7. EXPRESS AFFECTION

(a) VERBAL-

Smiles or laughs for no reason, other than affection felt for the adult.

(b) PHYSICAL

(1) Touching, hugging, embracing, holding and petting.
(2) Shares or makes friendly gestures—not asking for help with a toy, etc., but sharing it with the adult. Also behavior showing concern over the welfare or comfort of adult.

8. EXPRESS HOSTILITY TO ADULTS

(a) Hits, grabs, spits, etc., directed towards adults.
(b) Also the throwing of tantrums by the child.

Head hitting, screaming, dumping things out on the floor, etc.

(c) Rejects physical affection.
Adult tries to comfort a child after a disappointment and the child withdraws from the adult or actively rejects the adult's affection.

9. PRIDE IN PRODUCT - CREATION

Child is pleased with what he has done and shows it someway. Both verbal ("LOOK!") or non verbal—showing creation to adult.

10. IMITATION OF ADULT

CHILD IMITATES ADULT'S <u>ACTIONS</u>.

SOCIAL ABILITIES SCALE GROUND RULES

1. A DIRECTIVE is either verbal, physical or a combination of the two. Cues from the preceding and following situation will help distinguish a DIRECTIVE. A DIRECTIVE is necessary for compliance/noncompliance to be scored.

2. There is a 10 second time limit on compliance/noncompliance categories.

3. The removal of the cardboard barrier from in front of the cans by the mother or other adult is considered a directive. This is due to the fact that the cardboard's removal is something of a "Go" signal to the child, telling him to attempt to find the toy under the cans.

4. The placing of the cardboard barrier in front of the cans by the mother or other adult is not considered a directive. The removal of the child's hands by the adult or mother is considered to be one.

5. The mother or other adult's repositioning of the child is not to be considered a directive.

6. When two or more behavior categories occur in a 15 second period, the one to be scored is the one that is predominant,

time-wise. Thus if two behaviors occur, the one to be scored is the one that occurs for the greatest portion of time.

7. Resistent—physical—More visible, dramatic instances of noncompliance. More Gross-Motor sorts of resistence.

8. To simplify the coding of noncompliance, it was decided to not have a six alone.

SERIES TEST

POSITION

Varied

ACTION

1. Point to and name parts of the baby's body such as, arm, eye, nose, mouth, head, neck, ear, foot, toe, and hand.

2. Continue to name and explore pictures of objects in magazines and objects around the house with the baby.

AIM OF THE GAME

The baby vocally responds after you name the object (two names).

PURPOSE

To give names to objects.

POSITION

1. Baby's position: sitting on the floor.

2. Mother's position: facing the baby.

ACTION

1. While the baby is watching, place his favorite toy in a kitchen pan.

2. Cover the pan containing the toy with a towel.

3. Dump the object out onto the floor keeping this operation hidden under the dish towel.

4. Show the empty pan to the baby and observe where he looks.

AIM OF THE GAME

The baby searches under the towel and gets the object.

PURPOSE

To help the baby realize that objects don't disappear and that if he looks, he will find them.

POSITION

Varied.

ACTION

1. Wrap the child's favorite toy in a piece of brown paper while the child is watching.

2. Give the wrapped toy to the child.

3. Say, "Get the toy out of the paper."

AIM OF THE GAME

The child unwraps the paper and gets the toy.

PURPOSE

1. To help the child understand that although the object is out of sight, it is still there.

2. To teach the child to work for things he wants.

POSITION

1. Child's position: sitting on a low chair or on the floor.

2. Mother's position: facing the child.

ACTION

Sing to the child:

> "All around the carpenter's bench,
> The monkey chased the weasel,
> The monkey thought twas all in fun
> Then POP, goes the weasel."

As you sing "POP," take the child's hands, pull him up and then back down as you complete "goes the weasel."

AIM OF THE GAME

The child listens for the "POP" and jumps up by himself when he hears it.

PURPOSE

To help the child listen for a special signal.

POSITION

Child's position: sitting on the floor or at a table.

ACTION

1. Place a small container, with a hole (like a piggy bank) in its screw-on lid, on the floor.

2. Drop buttons (or pennies) through the slot while the child is watching and say, "Watch the buttons go in." "See how mommy does it."

3. Empty the jar and put the lid back on.

4. Put the jar and buttons in front of the child.

5. If he does not put any buttons in the jar, put some in for him and say, "Let's put the buttons in the jar."

6. Empty the jar and let the child try again.

NOTE: Don't make the slot too small. It should be easy for the buttons to go in the slot.

AIM OF THE GAME

The child puts buttons through the slot by himself.

PURPOSE

To help the child gain skills in using his small muscles.

POSITION

Varied

ACTION

1. Hold a small object or food in one of your hands.
2. Show the child the object and transfer it back and forth between your hands several times.
3. Present both hands closed and say, "Which hand is it in?"
4. When the child reaches for one of your hands say:
   (A) "No, no, no. It's not in this hand." Immediately open your hand. "This hand is empty." "Where is it?"
   (B) "Yes. It is in this hand." (and then, immediately open your hand.)

AIM OF THE GAME

The child reaches for one hand or the other and indicates by action or expression that he understands the NO or YES response of the mother before she opens her hand.

PURPOSE

To help the child learn that he can get information from words. Example: NO doesn't always mean DON'T.

POSITION

Varied

ACTION

1. Place something of interest to the child (marble, piece of candy, button, etc.) inside a match box. Give it to the child and tell him, "Get the marble out of the box."

2. Open and close the box in front of the child a few times.

3. If the child can't get the object, open the box slightly and say, "Now, try to get the marble."

AIM OF THE GAME

The child gets the object out of the box.

PURPOSE

To help the child learn a new way to get things he wants.

POSITION

1. Child's position: sitting on the floor or sofa.

2. Mother's position: next to the child.

ACTION

1. Place a few objects, familiar to the child, out of his reach, and name the objects.

2. Tell the child, "Give me the dolly." "Get the ball, etc., etc."

3. When the child brings the object say, "Thank you for the doll." "Very good!" "Now, bring me the ball."

AIM OF THE GAME

The child gets the objects the mother asks for.

PURPOSE

To help the child learn the names of: 1. Objects (dolly, ball) and
2. Action (give, get).

POSITION

1. Child's position: sitting on the floor.

2. Mother's position: out of the child's sight, watching what he is doing.

ACTION

1. Place four small stones and four bottle caps in front of the child as shown in the diagram, or any group of four objects.

2. Let the child play with them without any directions.

3. After he has played a while, say, "Look, Jim, these can go together because they look alike and so can those. See, these are stones. They are round. These are caps, they come off bottles and have sharp edges." (Or anything that you can see or feel that make them different.) Start a pile and ask him to help you put all the same things together. This is hard, they go together. If he can't do it, you go ahead and make the pile, then jumble them again, and repile until he gets the idea.

4. Set them up again scattered and watch what he does.

5. Put down twigs and small cans or any other two groups of things. Ask him to put them in piles, show him what a pile is, as you did before... Even if he could do it the first time doesn't mean he'll remember. Be patient and teach him by showing, and praising him when he does something right.

6. Be sure that there are different objects around for him to play with at other times when he is playing. If you see him putting a group together, tell him what he is doing and smile at him, when he works with you and gets it right.

AIM OF THE GAME

The child separates objects into the correct piles.

PURPOSE

To help the child learn about the similarities and differences in objects by letting him have experiences with two specially chosen objects that have similarities and differences.

POSITION

1. Child's position: in a crawling position on the floor.

2. Mother's position: behind the child.

ACTION

1. Place familiar items across the room (spoon, toy, doll). Tell him the name of the object, as you place it. "This is a spoon, etc."

2. Tell the child, "Go get the spoon, ect." (Without pointing or giving him any help except your words.) If he doesn't go after it, then help in some way, by pointing or bringing it a little closer, or showing him what you mean.

3. When he brings it to you, take the object from the child and hug him.

AIM OF THE GAME

The child gets the object he is told to get.

PURPOSE

To help the child recognize different objects and link the object's name with its appearance. He also learns to follow verbal directions.

POSITION

Varied

ACTION

1. Say to the child, "Do you want to take a walk?"

2. Walk around outside of the house.

NOTE:

When you take the walk you should encourage the child to do things that he can't do in the house. Example: "Let's touch the tree." "See how it feels." "Let's feel the sand." "See the bird."

Do this when you have some time so that you can enjoy it yourself.

AIM OF THE GAME

The child indicates that he wants to take a walk when the mother asks, "Do you want to take a walk?"

PURPOSE

To help the child understand the connection between words he hears and things.

POSITION

Varied

ACTION

1. Ask the child questions, and tell him things that help him identify members of the family, self and others.

2. "Where is mama?" "Point to mama." (point to self) "Where is Suzy?" "Point to Suzy." "There's Suzy." (point to Suzy) "Where is Johnny?" "Point to Johnny." "You're Johnny." (point to him).

AIM OF THE GAME

The child points to or goes to the person named.

PURPOSE

To help the child increase his language skills and know the names of the people in his world.

POSITION

Varied

ACTION

1. Put one of the child's favorite toys under one of three different sized tin cans that have been placed in a line.

2. Don't let the child see which can you hide the toy under.

3. Ask the child to get the toy.

4. Change the cans around, but keep the toy in the same spot.

5. Keep repeating the game, showing the child where the toy is when he misses.

AIM OF THE GAME

The child removes the can the toy is under and gets the toy at least three times in a row.

PURPOSE

To help the child learn that objects do not always move with their surroundings.

POSITION

The mother and the child are sitting together.

ACTION

1. Turn pages in a magazine or book and say to the child, "Where is the car?" "Touch the horsey, etc."

2. Then say, "Now look at this. This is the word for a car." Point to the word and then say, "Point to the car." "Touch the word for car."

AIM OF THE GAME

The child points to the object named and the name of the object.

PURPOSE

To help the child learn the names of different objects in magazines and books.

POSITION

Varied

ACTION

1. Imitate sounds for the child. Use your body to illustrate the action of the imitated object. "A jet goes zoom." "A duck goes quack." "A fire engine goes ding, ding, ding." "A train goes choo, choo" "A dog goes wuff."

2. Ask the child after each sound you make, "How does a jet go?, etc."

3. Use a picture or model of the objects when you play this game.

AIM OF THE GAME

The child imitates two of the sounds made.

PURPOSE

To help the child pronounce difficult sounds and to connect sounds with the objects that make them.

POSITION

Varied

ACTION

1. Fold a piece of paper a few times in front of the child.
2. Give the child a new sheet of paper and ask him to fold it.
3. If he doesn't fold it by himself, fold your sheet and ask him to fold his the same way.

AIM OF THE GAME

The child folds the piece of paper.

PURPOSE

To help the child become better at small muscle skills.

POSITION

Varied

ACTION

1. Play hide and seek with the child.
2. Hide from the child and let him see if he can find you.
3. Let the child hide from you.
4. Hide some of his favorite toys.

AIM OF THE GAME

The child finds the hidden person or object.

PURPOSE

To get the child to actively explore his environment and to encourage in him a good feeling toward discovery.

POSITION

Varied

ACTION

1. Tell the child to turn around and not to peek.

2. Put a toy under one of three different sized tin cans.

3. Ask the child to guess which can it is under.

4. Change the position of the cans but always put the toy under the same can.

4. When the child guesses the right can say, "Good boy! Let's try it a few more times and you can have your toy."

AIM OF THE GAME

The child picks (3 times in a row) the can the toy is under.

PURPOSE

To help the child understand that although he cannot see the object, it doesn't cease to exist.

POSITION

Child's position: on the floor, at the table or on the sofa.

ACTION

1. Ask the child if he wants to read a magazine.
2. If he does, give it to him. Show him how to turn the pages a few times and point to some of the items.
3. Let him look at the magazine by himself.

AIM OF THE GAME

The child turns the pages by himself and looks at the pictures.

PURPOSE

To help the child become familiar with magazines as things to read.

POSITION

Mother and child holding hands and standing on the floor.

ACTION

1. Walk around in a circle while you sing "Ring Around The Rosey."

2. Sit down when you get to DOWN in the line all fall down.

The song goes:

"Ring around the rosey,
Pocket full of posey,
Ashes, ashes, all fall down."

3. It is fun to change the rhythm of the song so that the child doesn't know when you are going to say all fall down.

NOTE: Play this with as many children in the circle as you can.

AIM OF THE GAME

The child goes down when you say all fall down.

PURPOSE

To get the child interested in games and to increase his coordination between listening and large muscle use.

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BIOGRAPHICAL SKETCH

Ronald Arthur Fannin was born July 26, 1948 in Ashland, Kentucky. He grew up in Daytona Beach, Florida and graduated from Mainland Senior High School in June, 1966. He graduated from Daytona Beach Junior College in March, 1968.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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